JUNE 1, 1959

STEEL
The Metalworking Weekly

A PENTON PUBLICATION

Connecticut's Gov. Abe Ribicoff . . .

Will meet "any one, any time" . . .

To sell his state to industry . . .

He exemplifies the energetic efforts of the 50 states to lure new industry as they battle for fiscal stability. For tips on how to evaluate state claims and pick the right site for your plant, see Page 52.

Steel Negotiators Far Apart in Pact Talks, with 30 Days to Go

More Metal Going in More Houses

What's New in Material Handling

Thicker Coatings Open Up New Markets for Vacuum Metallizing

What Barrel Finishing Can Do

Steelmakers Will Use More Oxygen

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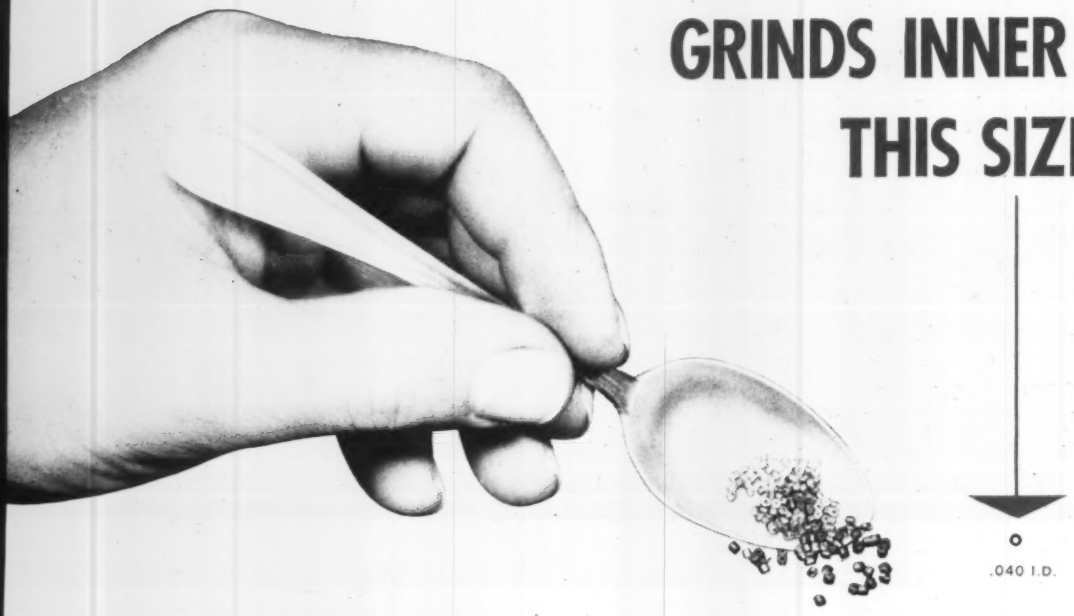
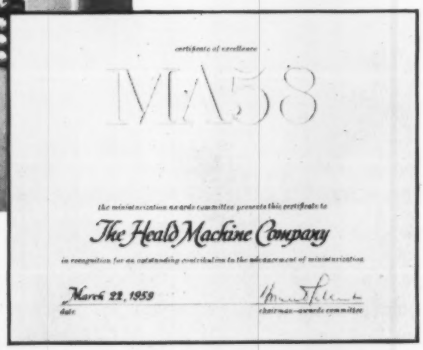
TURN PAGE

METALWORKING OUTLOOK
PAGE 37

Award-winning Model 090 Centri-Matic

GRINDS INNER RACES THIS SIZE




certificate of excellence
MA58
the miniaturization awards committee presents this certificate to
The Heald Machine Company
in recognition for an outstanding contribution to the advancement of miniaturization
March 22, 1959
date
chairman, awards committee

NEW HEALD DEVELOPMENT awarded
Certificate of Excellence in
1958 MINIATURIZATION AWARD
for unique, systems-engineered design

THIS AWARD, the first ever made to a machine tool manufacturer, cited the Model 090 for the following contributions to miniaturization.

"The Heald Model 090 Centerless Internal Grinding Machine is considered to be a radically new development, system-engineered specifically for improved production of miniature ball bearings. Whereas previous equipment had been modified to adapt it to miniature work, the Model 090 was completely designed for this purpose alone, with all components working at optimum efficiency. With this machine, inner races as small as .040" I.D. can be ground to .00015" size tolerance and 5 microinch finish in a fully automated 15-second cycle. Major advances in design include shoe-type centerless workholding with rotation from both front and rear faces — specially-designed superspeed wheelheads — hydrostatic anti-friction feeding cross slide with ultra-sensitive electronic control — and sensitized method for automatically maintaining precise wheel-to-diamond relationship and compensating for drift."

Whether you grind miniature parts or not, this development is a significant example of Heald's ability to solve tough precision-finishing problems. Your Heald engineer will welcome *your* problems, too.

HEALD

It PAYS to come to Heald

THE HEALD MACHINE COMPANY

Subsidiary of The Cincinnati Milling Machine Co.
Worcester 6, Massachusetts

Chicago • Cleveland • Dayton • Detroit • Indianapolis • New York

This Week in STEEL

The Metalworking Weekly

June 1, 1959 Vol. 144—No. 22

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Index available semiannually.
STEEL is also indexed by Engineering Index, 29 W. 39th St., New York 18, N. Y.

STEEL, the metalworking weekly, is selectively distributed without charge to qualified management personnel with administrative, production, engineering, or purchasing functions in U. S. metalworking plants employing 20 or more. Those unable to qualify, or those wishing home delivered copies, may purchase copies at these rates: U. S. and possessions and Canada, $10 a year; all other countries, $20 a year; single copies, 50 cents. Metalworking Yearbook issue, $2. Published every Monday and copyright 1959 by The Penton Publishing Co., Penton Bldg., Cleveland 13, Ohio. Accepted as controlled circulation publication at Cleveland, Ohio.

Metalworking Pulse ▶ TURN

Metalworking Pulse

INDUSTRIAL PRODUCTION INDEX

	WEEK ENDED MAY 23	PREVIOUS WEEK	MONTH AGO	YEAR AGO
Based on steel output, electric power output, freight carloadings, auto assemblies	171*	170	169	129

*Preliminary.

STEEL's industrial production index moved to an all-time high for the second consecutive week. Cause: Seasonal uptrends in electricity output and railroad freight carloadings.

Details on Page 67

U. S. PASSENGER CAR PRODUCTION

	WEEK ENDED MAY 30	PREVIOUS WEEK	MONTH AGO	YEAR AGO
Number of units assembled ..... (Source: Ward's Automotive Reports.)	120,000*	133,189†	118,059	66,574

*Estimated. †Preliminary.

After holding near the 135,000 unit mark for three straight weeks, auto production dipped in the latest period because of Memorial Day shutdowns. It will regain the former level after the holiday.

Details on Page 64

NATIONAL STEEL INGOT PRODUCTION

	WEEK ENDED MAY 31	PREVIOUS WEEK	MONTH AGO	YEAR AGO
Net tons (thousands)	2,671*	2,644	2,627	1,567
Index (1947-49=100)	166.3*	164.6	163.5	97.5
Percentage of capacity	94.5	95.5	94.5	56.5

*Estimated.

Steelmakers are well on their way toward a record-breaking first half. Scheduled output for last week topped the previous high of 2,657,000 tons produced during the week ended Apr. 13 of this year.

Details on Page 126

STEEL SCRAP PRICE COMPOSITE

	MAY 27	WEEK AGO	MONTH AGO	YEAR AGO
Based on No. 1 heavy melting grade at Pittsburgh	$33.67	$33.33	$34.33	$34.50

A rise of 34 cents in STEEL's composite price on prime grade of scrap restored the market to $33.67, the level prevailing at the beginning of May. Heavy consumption is expected to follow wage contract settlement.

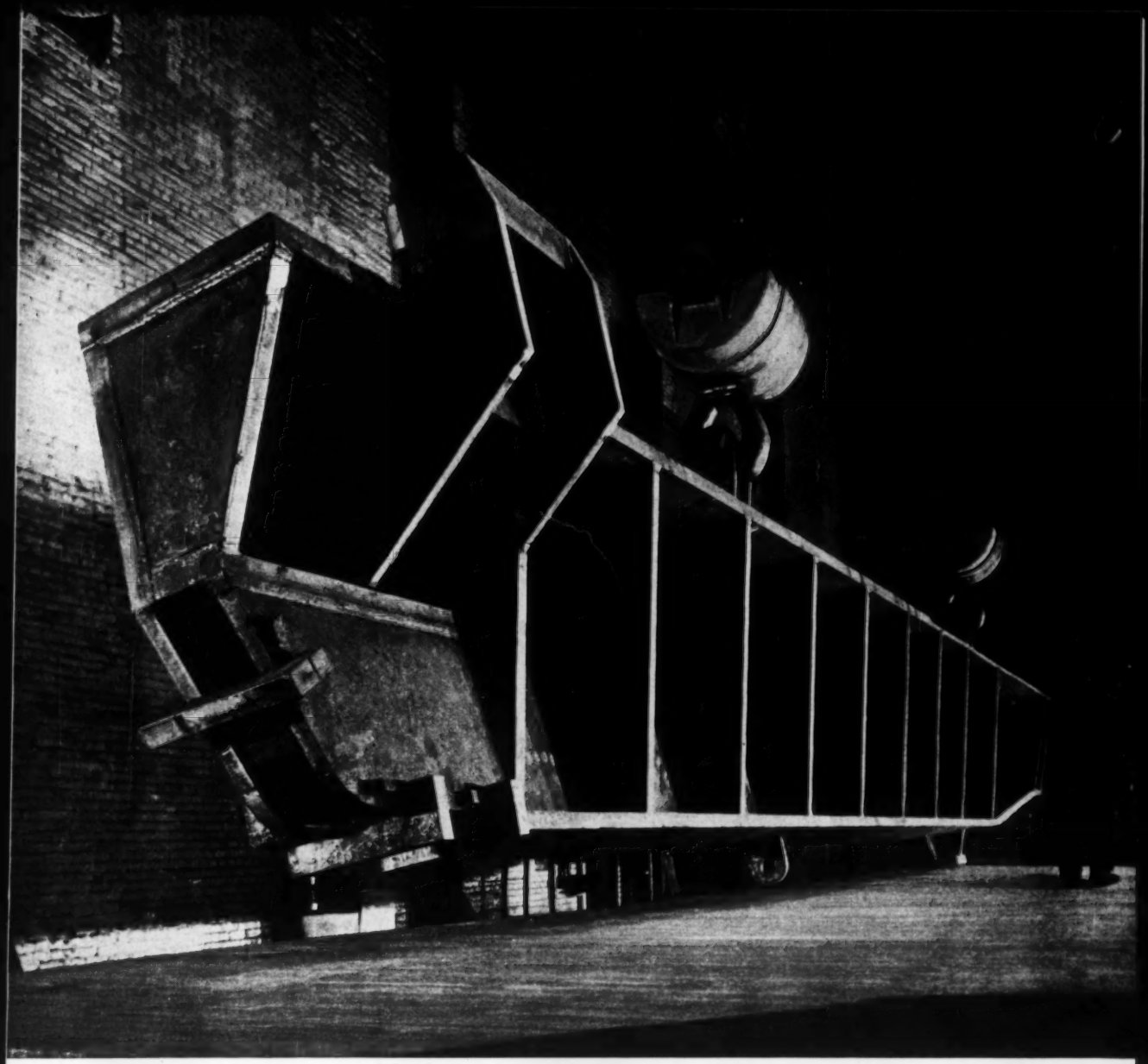
Details on Page 138

FINISHED STEEL PRICE INDEX

	MAY 26	WEEK AGO	MONTH AGO	YEAR AGO
Based on Bureau of Labor Statistics data (1947-49=100)	186.7	186.7	186.7	181.7

Steel buyers can expect across-the-board increases to compensate for whatever wage concessions, if any, are granted the union. Import steel prices are higher.

Details on Page 127



Sound welds every time

Fabricated from Bethlehem plates up to 3 in. thick, this loading apron will be part of a 35,000-ton capacity die-forging press.

The uniform quality of Bethlehem plates makes them ideally suited for weldment fabrication of all types and sizes. The use of Bethlehem plates, together with good welding technique, is assurance of sound welds every time. Bethlehem plates are available in a full range of sheared and universal mill sizes.

New Plate Catalog

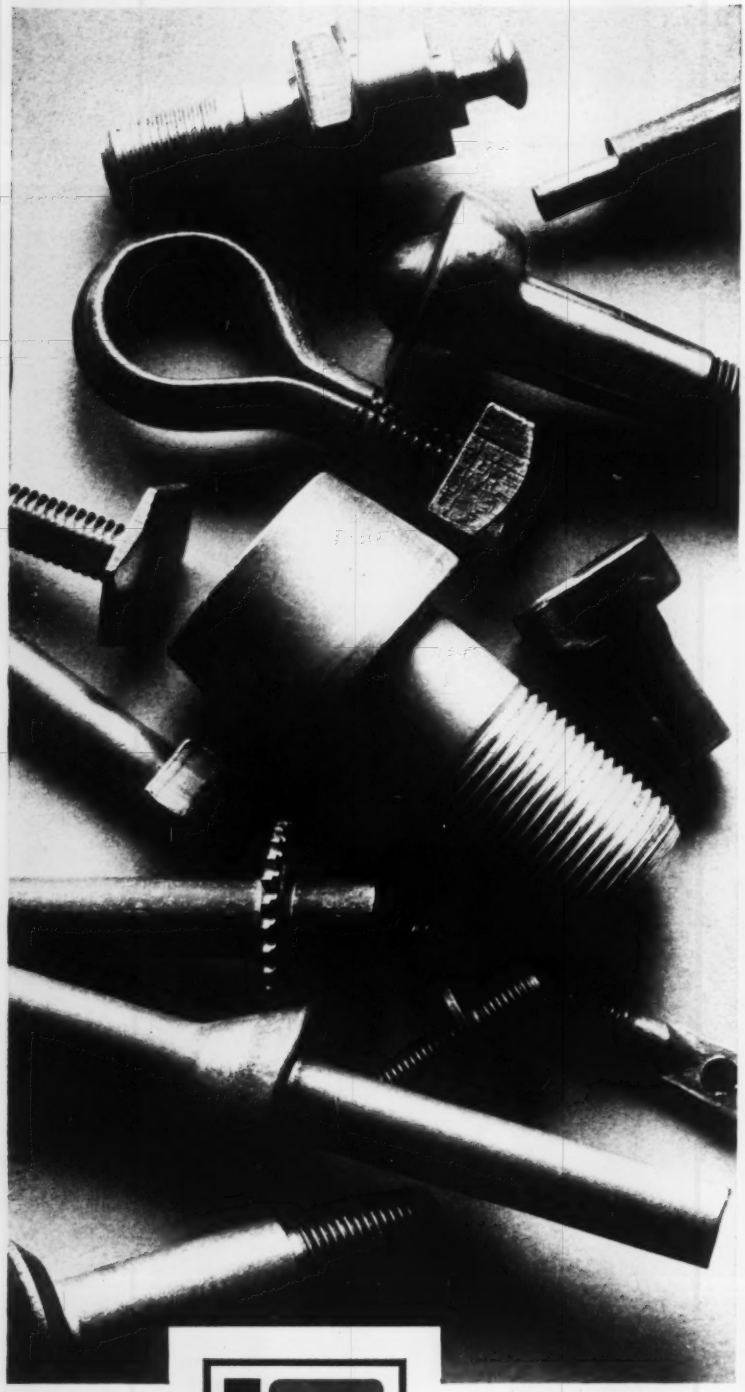
If you don't have our new catalog on steel plates, you may wish to have a copy of this useful reference volume. Just address a card or letter to the nearest Bethlehem sales office, or write to us direct at Bethlehem, Pa.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL



A bolt is a bolt... or is it?

At L & S, "bolts" often take on strange shapes...such as those shown here. Why? Because customers need them that way...to solve a specific fastening problem. Strange thing, though—what may seem very "special" to you may require only a slight modification of something we've already made. We have the know-how *and* the equipment to design it, produce it, economically! Send us your prints or problems.

L & S Fastening Engineering helps you "tighten up" on assembly costs

LAMSON & SESSIONS

5000 TIEDEMAN ROAD • CLEVELAND, OHIO

Plants in Cleveland and Kent, Ohio • Chicago and Birmingham

How TOCCO* Induction Annealing makes copper cable easier to handle in the field . . .

A world famous manufacturer of quality cable now treats its customers to the best with TOCCO-annealed cable that's easier to reel off, easier to splice and generally easier to handle in the field. Cable segments pass continuously through a TOCCO inductor coil at the rate of 23 feet per minute for the 800 mcm material illustrated. Many sizes of cable segments, up to one million circular mils, are annealed on one TOCCO unit.

TOCCO's many advantages over conventional annealing methods include:

1. TOCCO provides "bright annealing"—no discoloration.
2. TOCCO requires just a fraction of the space of conventional bell-type furnaces.
3. TOCCO's output is nearly four times that obtained by conventional annealing methods.
4. TOCCO equipment requires one operator as opposed to three required for the bell-type furnace operation.

Whether your products involve ferrous or nonferrous materials, look to TOCCO for an economical solution to your metal heating problems—annealing, brazing, hardening, melting or heating for forming or forging operations.

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Bertsch & Co.
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*LeBlond's lasting value is acknowledged everywhere.
THE R. K. LeBLOND MACHINE TOOL COMPANY
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LeBLOND of Cincinnati

You Name It . . . ?

Please direct all correspondence to attention of Ed Service, STEEL, 1213 W. Third St., Cleveland 13, Ohio

STEEL

June 1, 1959

Sound the Trumpets

With this issue, STEEL starts a new weekly feature. It is dedicated to you—the reader. It is your department. This is what we have in mind:

1. Here's your opportunity to be an honorary editor. We're offering you a place to air your problems, voice your complaints, give your interpretation of trends and events, or indulge in some do-it-yourself editorializing.

2. Here's a place for you to send in your questions—and get answers. Ed Service (our name for the editor who heads this up) and his Reader Service Center staff will help find the information you need . . . see that your problems reach the people who can do something about them . . . and will always be ready to help you anyway they can.

3. Here's the logical place for us to take you behind the scenes at STEEL as we have been doing for many years in a column with that label. It will be discontinued as will Letters to the Editor because this department will take over both functions.

You Name It

Here's your first assignment. Since this will be your department, we want you to name it.

The reader with the best suggestion will become Honorary Editor No. 1 and will receive a hand-lettered card attesting to that fact. Use the coupon below for submitting your entry.

What Others Suggest

We're not being lazy about this. The idea to have you christen this department came from some of your fellow readers when we field tested our new product.

Their suggestions include: *For Readers Only, Feedback, Readers' Forum, Manager Musings,* and *The Readers' Anvil.*

What's yours?

Readers Do Participate

In one sense, this new department merely recognizes something that has been going on for some time: Many of you have been participating in our editorial endeavors, probably more than you realize.

For example: Last fall, Detroit Editor Don Postma heard a lot of grumbling about the experts' forecasts of 1959 passenger car production. Some of it was uncomplimentary. This inspired the idea for the "Beat-the-Experts" contest which we ran in Mirrors of Motordom during late November and December. A lot of you—1681 to be exact—guesstimated auto production for the first six months of 1959. The names of winners will be announced in July after first half production figures have been totaled by *Ward's Automotive Reports.*

Second Contest Starts

With this issue of STEEL, the "Beat-the-Experts" contest is transferred to this department and now you have another crack at estimating production for the whole year. The prizes will be the same as those awarded to the best guessers of auto production in the first half of 1959: A scale model of General Motors' Firebird III will go to the best forecaster—with the ten runners-up getting full color prints of a dream car rendered by George W. Walker, Ford vice president and director of styling.

We have a letter from a real contender, Joseph F. Templin, general manager of Morris Basin Dry Docks, who writes: "Last year I estimated (for STEEL) that 4,244,005 passenger cars would be produced in 1958 . . . the total was 4,243,526; a difference of 479 cars. I thought I might at least get an honorable mention for being so close in my estimate."

You certainly do deserve an honorable mention, Reader Templin. Anyone who can call 'em that close has a good chance to win a Firebird III—small size—by estimating car production from Jan. 1 through Dec. 31, 1959. You'll find an entry blank in Mirrors of Motordom, Page 63. Just snip it out; fill in the blanks; and send it along to us. Only one entry per man is permitted. (Facsimiles are acceptable.) Entries must be postmarked before midnight, June 30, 1959. Anyone except employees of The Penton Publishing Co., may enter.

Fun and Fact

While the "Beat-the-Experts" contest is primarily for fun, we want this department to have

STEEL—1213 W. Third St., Cleveland 13, Ohio
Att: Ed Service, Reader Service Center

I suggest .....
as the name of this new department in STEEL.

YOUR NAME _____

TITLE _____

COMPANY _____

ADDRESS _____

CITY, STATE _____

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Roll Forming Equipment—Product dependability—integrity of manufacture—engineering for specific production needs have all contributed to establish Yoder equipment as the industry standard of excellence. Since 1909 Yoder-built machinery, including Pipe and Tube Mills, Roll Forming Equipment and Rotary Slitters, have earned world-wide customer satisfaction and recognition.

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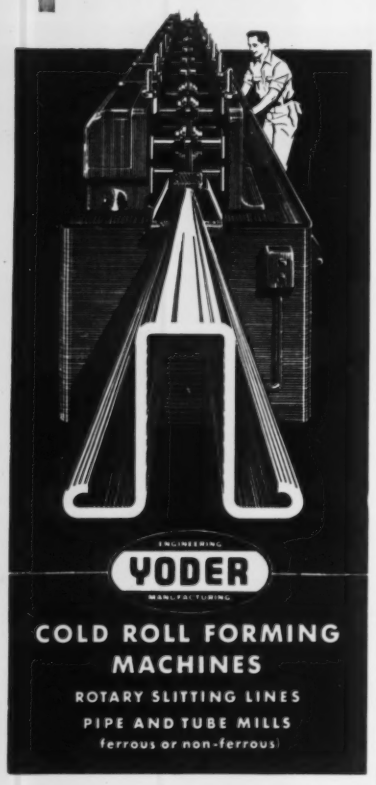


its serious and useful side.

As we stated, Ed Service can give you a big hand with statistics and information. He has files and files of reference material. He also has access to all the editors and to STEEL's Research Department.

The Inside Story

Here's a change that should help you spot trends. We've moved the Table of Contents from its former position on Page 5 to a choice location, just inside the front cover. Backing the canary colored listing is an innovation which records the life throbs in five major areas that are of interest to metalworking: It's the Metalworking Pulse, which at a glance, will yield information about the Industrial Production Index; U. S. Passenger Car Production, (just the meat for "Beat-the-Experts" guessers); and three sets of statistics which you'll want to watch during the steel-labor crisis—National Steel Ingot Production, the Steel Scrap Price Composite, and the Finished Steel Price Index.

Aluminum Intrigued Napoleon

When Napoleon heard about aluminum's light weight, he wanted to equip his armies with helmets and armor made of the metal. Then he learned the cost—$545 a pound. Today, aluminum is sold for about 25 cents a pound. Mr. Bonaparte was just born 190 years too early.

For a more modern story about aluminum, see our editors' 16 page study: "Aluminum Is on the Move," the third in a series of Trends in Metals reports, which will be run in the next issue of STEEL. The study features sections on production, important uses of aluminum, and its fabrication, plus a distribution survey. Some 3000 metalworking companies were included in the study.

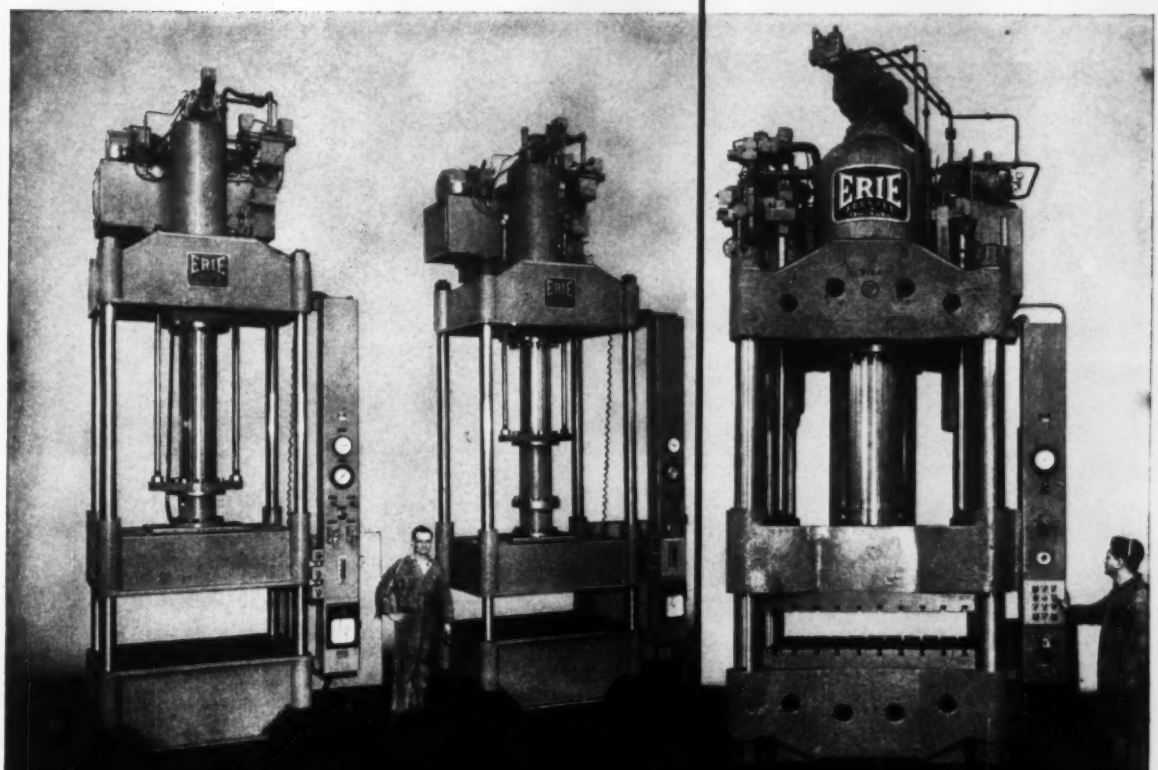
The Reader Is King

We think the reasons for this department are perfectly obvious. The most important person to any magazine is the reader. It is the editors' job to serve him to the best of their abilities. (No editor worth his salt believes any differently—and we think all the editors on STEEL are worth their salt.)

So we're convinced that it's only natural for a publication to devote part of its editorial space as a sort of outer lobby where you can smoke, meet your friends, speculate on the play, analyze the authors, and offer any suggestions you care to make. Ed Service is at your service.

These two 150-ton fiberglass molding presses offer 48" stroke... 54-ton pull back. When desired, the opening can be reduced by ram spacers which, in this case, are 12" and 24". The Oil Gear drive offers molders a very accurate pressing speed adjustment ... the ultimate possible. Controls are semi-automatic; plates are 56" x 42". Your maintenance men will welcome the minimum piping and valving on these self-contained presses.

This very rugged fiberglass press is rated 750 tons with a 48" stroke. The two pull backs give 150-ton stripping capacity. Oil Gear drive with quick-acting prefill system allows molders to utilize five ram speeds in their molding cycle. Automatic short stroking of pump at required pressures for long periods of time assures both reduced h.p. consumption and oil heating. Controls are semi-automatic, and the 2 steam-heated platens are 60" x 46".



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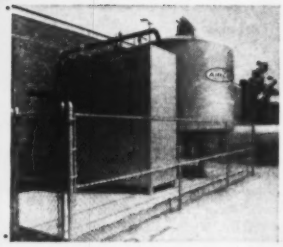
99.5% pure oxygen (O_2) ...by the ton or by the cylinder ... to a convenient location, inside or outside your plant ... for any process ... with absolute dependability

From more than 100 distribution and production points Airco today supplies American industry with oxygen and other high purity industrial gases. For the chemical industry ... missile fuel systems ... machine and manual cutting and welding ... steel making and processing ... flame hardening ... flame cleaning ... and for medical therapy and high altitude flight.

If you want to use oxygen for a new application or to improve the performance of current applications, Airco facilities are as near as your telephone.

Call in the Airco Engineering Service Representative. He is qualified to assist in planning a process with you from the very start. He is a long time expert in application techniques. He knows the rugged types of apparatus essential to oxygen processes. He knows in-plant distribution to consumption points. He knows how to make sure your supply will be ample at all times.

For O_2 ... Airco.



Right: Airco liquid oxygen station "installed" on customer site to assure large quantity storage for an uninterrupted supply.

Airco also supplies industry with ACETYLENE • ARGON CARBON DIOXIDE • HELIUM HYDROGEN • KRYPTON NEON • NITROGEN • XENON

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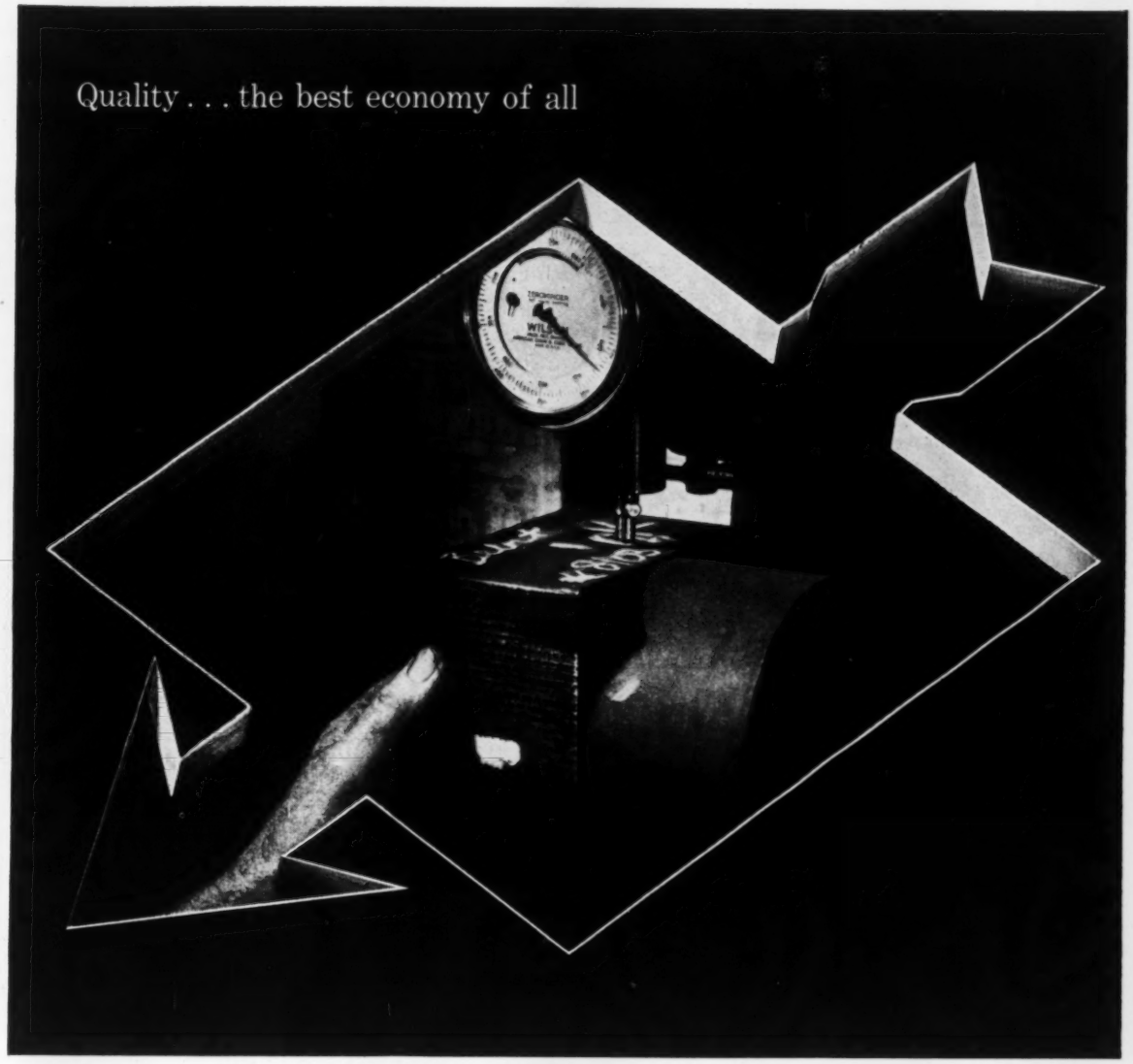

Photo courtesy of J. W. Rex Corp.

To hit the exact qualities you want . . . you need a choice of quenching oils

You can *get by* with just one quenching oil. But you can't always get the *best results* . . . not when you measure quality to a fine degree. Very often, you need a choice.

Sun makes quenching oils to reduce cooler-maintenance costs... oils with high antidecomposition qualities... oils for fast-quenching operations . . . oils for marquenching... and other "specials."

See your Sun representative for help in evaluating your quenching needs. He'll show you how to save money while maintaining quality . . . the best economy of all.

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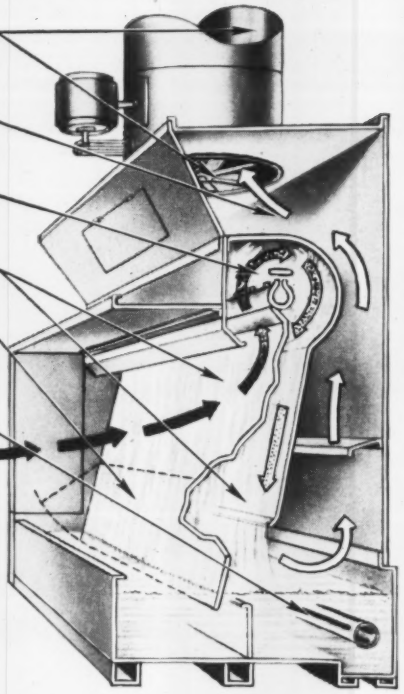
MAKERS OF FAMOUS CUSTOM-BLENDED BLUE SUNOCO GASOLINES

Style "E" Dynaprecipitor water wash spray booth

SAVES MONEY 10 WAYS



1 **Stack and fan stay cleaner, longer**
Virtually no pigment gets to this area.

2 **Exhaust air washed 4 times**
Pigment is scrubbed out and trapped in collecting pan.

3 **Unbroken water curtain**
No nozzles to clog. Manifold disperses water evenly.

4 **Booth stays cleaner**
Every paint collecting surface is water-scrubbed.

5 **Easy maintenance**
Hinged front water curtain permits easy skimming of pigment from collecting pan.

6 **Clog-free water circulating system**
No dead-ends to accumulate sediment—is self-flushing.

7 **Saves on floor space**
Short depth wash unit gives water wash spray booth benefits in regular booth space.

8 **Inexpensive to own**
These booths are mass produced using standardized assemblies—available in 70 sizes and styles.

9 **Economical to operate**
Maintenance costs are low. Interruptions to painting production for cleaning are few and short.

10 **Insurance savings**
Earns lower insurance rate than conventional dry-type booth. Properly installed, exceeds requirements of fire, health and state authorities.

All the facts in this descriptive bulletin. Ask your Binks jobber or industrial distributor for Bulletin DUE, or write direct.

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Open to all...NO TUITION...covers all phases.

9037

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CALENDAR
OF MEETINGS

June 2-4, National District Heating Association: Annual meeting, Skytop Club, Skytop, Pa. Association's address: 287 N. Euclid Ave., Pittsburgh 6, Pa. Secretary-treasurer: John F. Collins Jr.

June 9-12, Material Handling Institute Inc.: National exposition of material handling equipment, Public Auditorium, Cleveland. Institute's address: 1 Gateway Center, Pittsburgh 22, Pa. Managing director: L. West Shea.

June 11-12, Pressed Metal Institute: Sales conference, Bedford Springs Hotel, Bedford, Pa. Institute's address: 3673 Lee Rd., Cleveland 20, Ohio. Managing director: Harold A. Daschner.

June 13-15, Metal Powder Industries Federation and Powder Metallurgy Committee of the Metallurgical Society, AIME: International conference on powder metallurgy, Hotel Biltmore, New York. Information: Metal Powder Industries Federation, 130 W. 42nd St., New York 36, N. Y.

June 14-16, National Association of Metal Finishers: Annual meeting, Statler-Hilton Hotel, Detroit. Association's address: 60 Bently Rd., Cedar Grove, N. J. Executive secretary: P. Peter Kovatis.

June 14-17, National Association of Purchasing Agents: Annual meeting and exhibit, Waldorf-Astoria Hotel, New York. Association's address: 11 Park Place, New York 7, N. Y. Association's address: 11 Park Place, New York 7, N. Y. Executive secretary: G. W. H. Ahl.

June 14-17, National Industrial Advertisers Association: Annual meeting, Fairmont and Mark Hopkins Hotels, San Francisco. Association's address: 271 Madison Ave., New York 16, N. Y. President: John C. Freeman.

June 14-18, American Society of Mechanical Engineers: Semiannual meeting, Chase-Park Plaza Hotel, St. Louis. Society's address: 29 W. 39th St., New York 18, N. Y. Secretary: O. B. Schier.

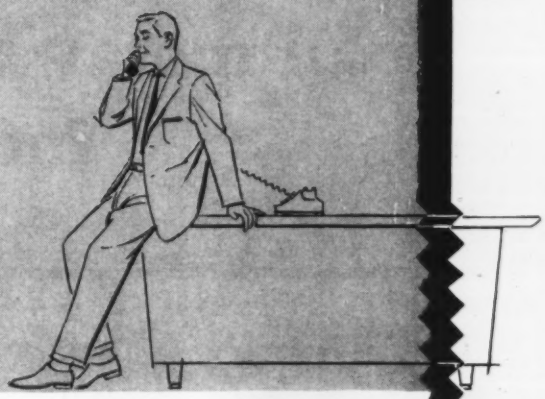
June 14-19, Society of Automotive Engineers: Summer meeting, Chalfonte-Haddon Hall, Atlantic City, N. J. Society's address: 485 Lexington Ave., New York 17, N. Y. Secretary: John A. C. Warner.

June 15-19, American Electroplaters Society: Annual meeting and industrial finishing exposition, Statler-Hilton and Sheraton-Cadillac Hotels, and Detroit Artillery Armory, Detroit. Society's address: 445 Broad St., Newark 2, N. J. Executive secretary: John P. Nichols.

June 16-19, American Marketing Association: National conference, Statler-Hilton Hotel, Cleveland. Association's address: 27 E. Monroe St., Chicago 3, Ill. Executive director: William C. Gordon Jr.

June 21-24, Drop Forging Association: Annual meeting, Essex and Sussex Hotels, Spring Lake, N. J. Association's address: Public Square Bldg., Cleveland 13, Ohio. Executive vice president: Dwight M. Allgood.

HOW YOUR REPUBLIC BOLT AND NUT DISTRIBUTOR CAN HELP YOU...



Cut fastener-inventory costs and confusion

It is as pointless as a wrong-threaded nut to put up with the costs and confusion of unnecessary fastener inventories. Your exact requirements can be delivered to you immediately by your local Republic Bolt and Nut Distributor.

He maintains complete inventories of fasteners of all types and sizes. And he is always prepared to provide quick deliveries—in broken or full lots, in quantities from one bolt ... to a case ... to a truckload.

Your local distributor is a qualified expert at maintaining fastener inventories with minimum overhead expense. He is therefore able to meet your needs at much lower costs than would be possible from your own on-hand stocks.

Your local distributor also offers a wide range of other services—complete product information, knowledge of current trends in the fastener industry, and many more.

Get acquainted now with your local Republic Bolt and Nut Distributor. A simple phone call is all that is required.

Call your local distributor for quick deliveries of...

REPUBLIC Bolts and Nuts

REPUBLIC STEEL

Symbols of Service

to all metal-working industries

The Morse "house emblem" and the NIDA seal are *double warranty* of the best you can get in quality and service.

For Morse-Franchised Distributors are like the tools they sell . . . tested and proven on their jobs . . . men of experience and responsibility who know how to get you top value for every dollar you spend on cutting tools.

So call him in today . . . *your* Morse-Franchised Distributor. You'll find him more and more of a business asset, the longer you do business with him.

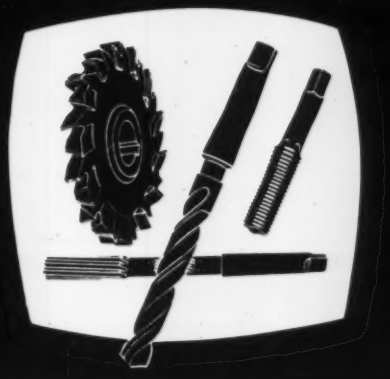
MORSE TWIST DRILL & MACHINE COMPANY
NEW BEDFORD, MASSACHUSETTS

WAREHOUSES IN NEW YORK, CHICAGO, DETROIT, DALLAS, SAN FRANCISCO

A Division of VAN NORMAN INDUSTRIES, INC.

Morse

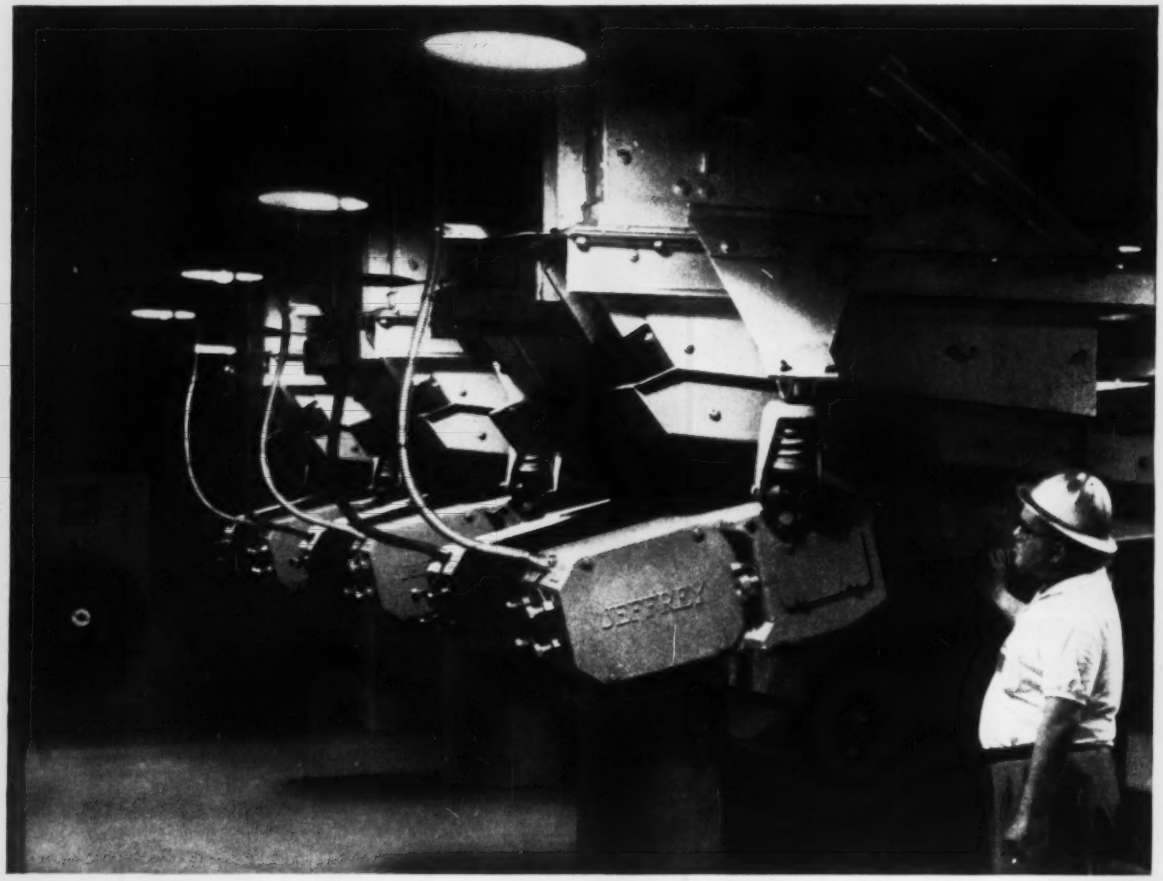
CUTTING TOOLS



INDUSTRIAL DISTRIBUTORS

SERVING INDUSTRY ECONOMICALLY

THE RIGHT HAND OF PRODUCTION



324 of these Type 4DTH feeders draw minus ¾" ore from surge bins, regulate 2,700 ton/hr. flow to 27 rod mills.

Where round-the-clock performance is a must...

Jeffrey feeders measure out 45 tons of Taconite every minute!

At this huge $300 million dollar plant, 372 Jeffrey vibrating feeders regulate the flow of flint-hard taconite to crushers and rod mills. Ore is crushed, separated and pelletized on a 24-hour, 365 days-per-year basis. Annual raw ore consumption is a staggering 22,500,000 tons.

Although the Jeffrey feeders at this plant are specially engineered, they are adaptations of standard designs, perfected through more than 25 years' experience in dealing with over 300 different solid materials.

Use Jeffrey's long experience and proved line of vibrating feeder equipment as an economic solution to your solid material handling problems. Write for Catalog 930—describes in detail the complete line of Jeffrey vibrating equipment, gives specific technical data, shows hundreds of applications.

Jeffrey vibrating equipment feeds, conveys, cools, drys, packs, screens, weighs solid materials roughly fitting these requirements:

Capacity	A few ounces to 2000 tons/hr.
Size	One micron to four-foot cubes
Density	4 lbs/cu. ft. to 400 lbs/cu. ft.
Moisture	Dripping wet to bone dry
Temperature	−30°F. to 2000°F.
Hardness	From wood flour and peat to abrasive grains and glass cullet

THE JEFFREY MANUFACTURING COMPANY
889 North Fourth Street • Columbus 16, Ohio

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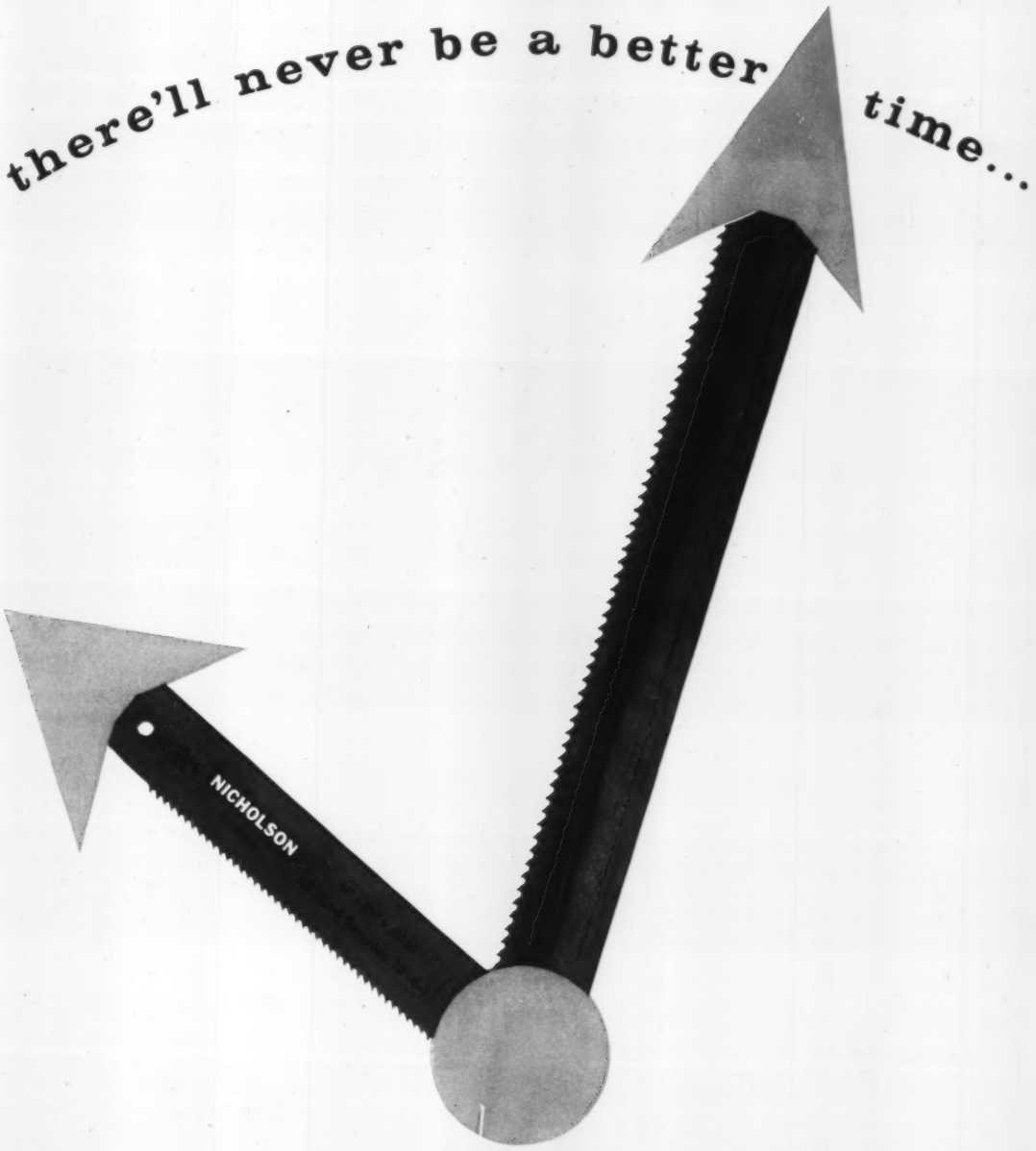
CONVEYING • PROCESSING • MINING EQUIPMENT...TRANSMISSION MACHINERY...CONTRACT MANUFACTURING

there'll never be a better time...



for you to call your distributor of Nicholson or Black Diamond blades. Ask him for a first order of the blades you regularly use.

You'll like them. Not that we promise miracles. We don't. But we do promise that you'll get as fine a blade as money can buy. And not much money at that, considering the way we make them. The Nicholson or Black Diamond trademark never goes on our blades until our inspectors are positive they deserve it. And they're hard to please.

A good many industrial blade buyers and users have been using our blades for nearly a year now. Best gauge of the way they like them is the way they keep reordering them. Isn't it time for you to call your Nicholson or Black Diamond blade distributor? Never be a better time.

If you use Ground Flat Stock—or could—your Nicholson or Black Diamond blade distributor can save you $ in this department, too. Ask him for details.

Industrial Distributors provide the finest goods and services in the least possible time. Our products are sold exclusively through them.

NICHOLSON

Nicholson File Company, Providence 1, Rhode Island

FILES • ROTARY BURS • HACKSAW AND BAND SAW BLADES
GROUND FLAT STOCK • INDUSTRIAL HAMMERS

Manufacturers of Cold Headed Fasteners Since 1888

Hubbell has the capacity to produce and deliver on time the finest quality standard or special fasteners in the quantity required up to a maximum diameter of ⅜". This statement is backed by the facilities listed here and supported by over 70 years' experience in cold heading.

Each operation is quality controlled to insure high quality and precision.

Mass production is maintained without sacrificing accuracy or quality.

The use of our engineering service offers the ultimate in engineering know-how.

Prices and delivery on request. Simply send blueprint and/or sample of the item.

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INCORPORATED
Machine Screw Dept. **Bridgeport 2, Conn.**

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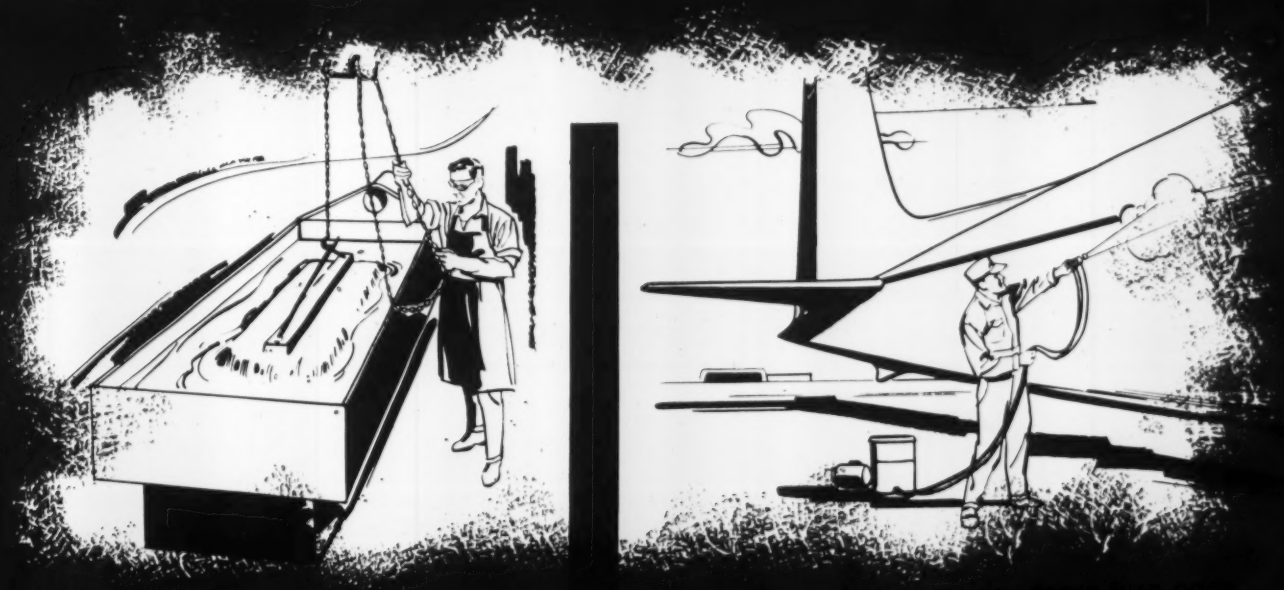
NEW
from DIVERSEY

a complete selection of

for all organic finishes including epoxies



SELECTION GUIDE

HOT...COLD...SPRAY...DIP
CAUSTIC...SOLVENT...CRESOL

whatever your stripper requirements... DIVERSEY has the answer

Modern industrial practice presents many opportunities for substantial savings through the use of the *right* paint stripper. Repainting of rejects that did not meet finishing standards; removal of over-spray from paint racks and other equipment; removal of old finishes to modernize or renovate old capital equipment . . . these are typical of the hundreds of industrial applications requiring a safe, fast and economical paint stripper.

Obviously the requirements for stripping operations vary widely. The vast multiplicity of modern finishes and primers . . . plus the wide selection of metals to which they can be applied . . . give rise to an extremely large number of possible combinations. In addition, the size and weight of the objects from which paint is to be removed make for further complications.

Diversey, therefore, offers a complete selection of six different paint strippers to provide the greatest possible flexibility. This chart will help you to evaluate the one which will supply the most efficient and economical answer to your particular requirements.

For complete information on any DIVERSTRIP paint stripper, see Diversey Technical Bulletins.

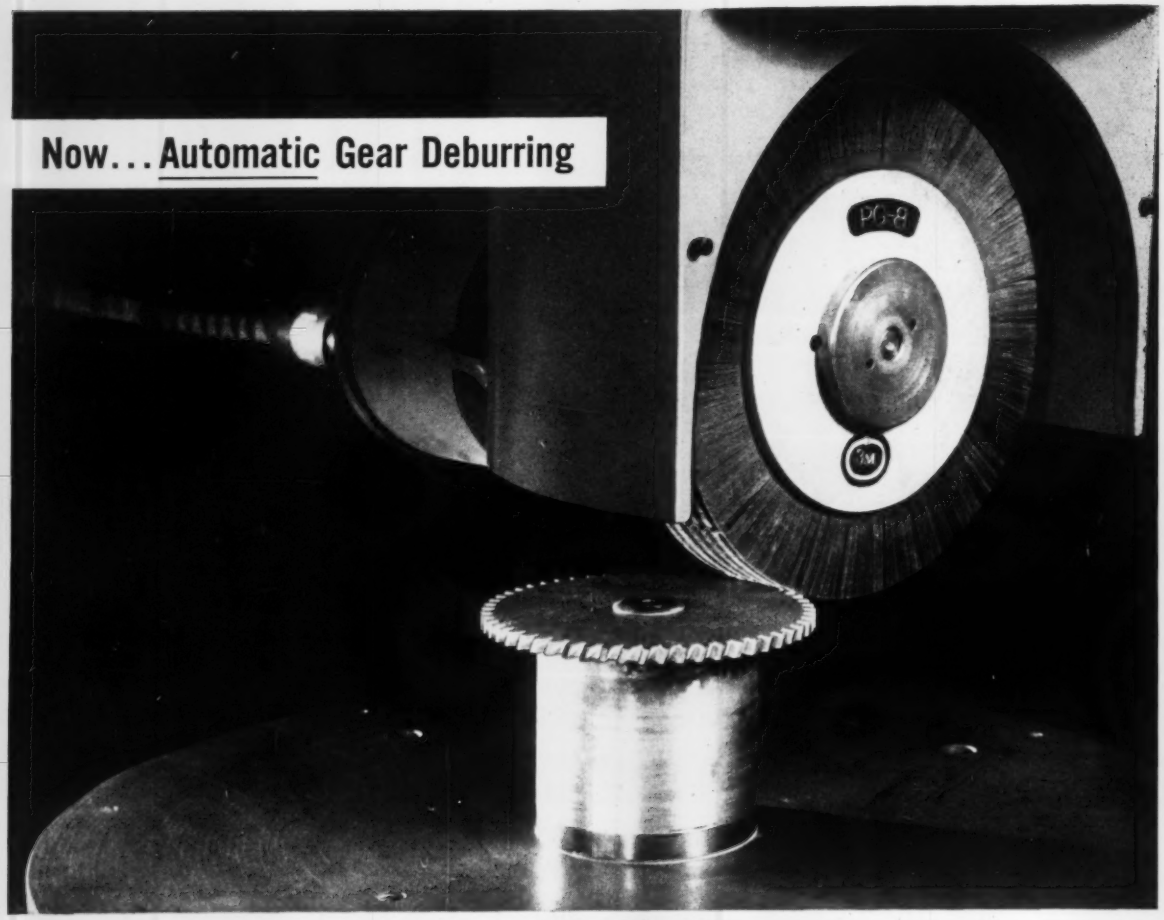
NAME AND GENERAL DESCRIPTION
BOND RELEASE OR SOLVENT TYPE
* **DIVERSTRIP S-90.** The fastest, most efficient "bond release" type stripper, for use in dip or soak applications. Wrinkles film and loosens bond between paint and metal, causing paint to peel off and not go into solution.
* **DIVERSTRIP S-70.** Economical "bond release" type stripper designed to provide maximum efficiency at minimum cost, in dip or soak applications. Action similar to S-90 above.
* **DIVERSTRIP T-100.** The fastest, most efficient "bond release" type stripper for use in spray or brush applications. Has high viscosity for maximum efficiency on vertical surfaces. Does not dissolve paint but loosens bond, so it can be flushed off.
* **DIVERSTRIP T-80.** Economical "bond release" stripper for use in spray or brush applications. Action similar to T-100 above. Provides maximum economy in majority of applications.
ALKALINE SOAK TYPE
DIVERSTRIP G-20. A new highly efficient and economical soak type stripper for use at elevated temperature. Dissolves paint film, also emulsifies or saponifies vehicle. Provides greatest economy. Pat. No. 2584017
ORGANIC SOAK TYPE
DIVERSTRIP O-50. A new fast acting cresol base stripper designed particularly for soak applications on zinc or magnesium . . . usually rapid stripping characteristics make it also advantageous on other metals. Quickly dissolves paint coating leaving a paint free surface. *PATS. PEND.

TO DIVERSEY PAINT STRIPPERS

METHOD of APPLICATION and APPLICATION TEMPERATURE	USE ON THESE FINISHES	USE ON THESE METALS	REMARKS
S-90 and S-70. Used in dip or soak applications at normal room temperature. Provide adequate ventilation. Solutions are used undiluted.	Epons, Alkyds, Acrylics, Silicones, Nitrocellulose, Butadiene Copolymers, Chlorinated Rubber, Drying Oil, Phenolics, Vinyls, Chromates and other modern finishes and primers.	Steel, cast iron, copper, brass and aluminum and any of their alloys. Can be used on zinc or magnesium and their alloys under most conditions.	Features high speed on difficult stripping operations. Rinses easily and completely from treated surface. Controlled evaporation provides longer solution life for greater economy. Packaged with net volumes of 5 gal. or 53 gal. non-returnable steel drums. Has no flash point . . . provides maximum safety.
			Rinses easily and completely from treated surface. Controlled evaporation provides longer solution life for greater economy. Has flash point of 118°F. (Tag open cup). Packaged with net volumes of 5 gal. or 53 gal. non-returnable steel drums.
Should be used undiluted at normal room temperature by either spray or brush application. Provide adequate ventilation.	Alkyds, Acrylic, Epons, Silicone, Phenolics, Ureas, Vinyls, Chlorinated Rubber, Nitrocellulose, Chromates and other modern finishes and primers.	Steel, cast iron, copper, brass and aluminum and any of their alloys. Can be used on zinc or magnesium and their alloys under most conditions.	Features high speed on difficult stripping operations. Has good flushing properties. Has no flash point . . . provides maximum safety. Rinses quickly and completely from treated surfaces. Packaged with net volume of 5 gal. or 53 gal. non-returnable steel drums.
			Has good flushing properties. Specially formulated to rinse quickly and completely from treated surfaces. Has flash point of 118°F. (Tag open cup). Packaged with net volumes of 5 gal. or 53 gal. non-returnable steel drums.
Used in solutions prepared by adding from 10 to 26 ounces per gallon of water. May be used at temperatures of 180°F. to boiling.	Alkyds, Butadiene Copolymers, Cellulose, Chlorinated Rubber, Drying Oils, Epons, Nitrocellulose, Phenolics, Urea . . . other modern primers and paints.	Steel, cast iron, copper, brass, magnesium and their alloys. Should not be used on zinc or aluminum and their alloys, unless etched surface is acceptable.	Has reserve stripping power for long solution life. Excellent for cleaning paint spray booth equipment. May be used in circulating water for paint screens, or applied in same manner as paint Packaged in 425 lb. non-returnable steel drum.
Use in soak applications, diluted with 15% water by volume. Usually satisfactory at normal room temperatures. Faster stripping action obtained at elevated temperatures. Can be used at temperatures near boiling. Provide adequate ventilation. Personnel should wear rubberized canvas gloves, aprons, boots and goggles.	Acrylic Lacquers, Alkyds, Butadiene Copolymers, Chlorinated Rubber, Epons, Nitrocellulose, Phenolics, Silicones, Ureas, Vinyls and many other modern primers and finishes.	All metals except aluminum and its alloys. Particularly effective on zinc and magnesium and their alloys. May be used for stripping paint coatings from zinc plated surfaces without danger of removing the zinc.	Freezes at 38°F. Must be stored above this temperature. Is a non-flammable liquid. Packaged in 30 gal. non-returnable steel drums.

For complete information please write to Metal Industries Department, The Diversey Corporation, 1820 Roscoe Street, Chicago 13, Illinois.

DIVERSEY®



3M "PG" Wheels Cut Gear Deburring Costs up to 75% with New Barber-Colman Deburrer

Spur or helical gears and sprockets can be deburred automatically, rapidly and economically by this new Coated Abrasive method. Developed through joint effort between Barber-Colman Company and 3M Company, this method eliminates the costly hand operations—filing, grinding, wire-brushing—and expensively slow machine operations previously required for precision deburring.

The heart of the method is the versatile 3M "PG" Wheel. As shown, the abrasive leaves of the "PG" Wheel conform to the *exact* shape required to deburr either spur or helical gears. On-the-line tests of this 3M—Barber-Colman team have shown unit cost reductions of 75% and more on a variety of gears.

Write us today for complete information on this new method and machine and for 3M technical assistance on any grinding and finishing operation in your plant. See how the right abrasive can cut your costs and widen your profit margin. Address your request to 3M Company, Department GJ-69, St. Paul 6, Minnesota. No obligation, of course.

"PG" Wheels are manufactured in U.S.A. by 3M Company, St. Paul 6, Minn. Export: 99 Park Avenue, New York. Canada: London, Ontario

WE RECOMMEND
How to use coated abrasives to cut costs, improve production, shown in the new 426 page book
COATED ABRASIVES
MODERN TOOL OF INDUSTRY
At bookstores or McGraw-Hill, N. Y.

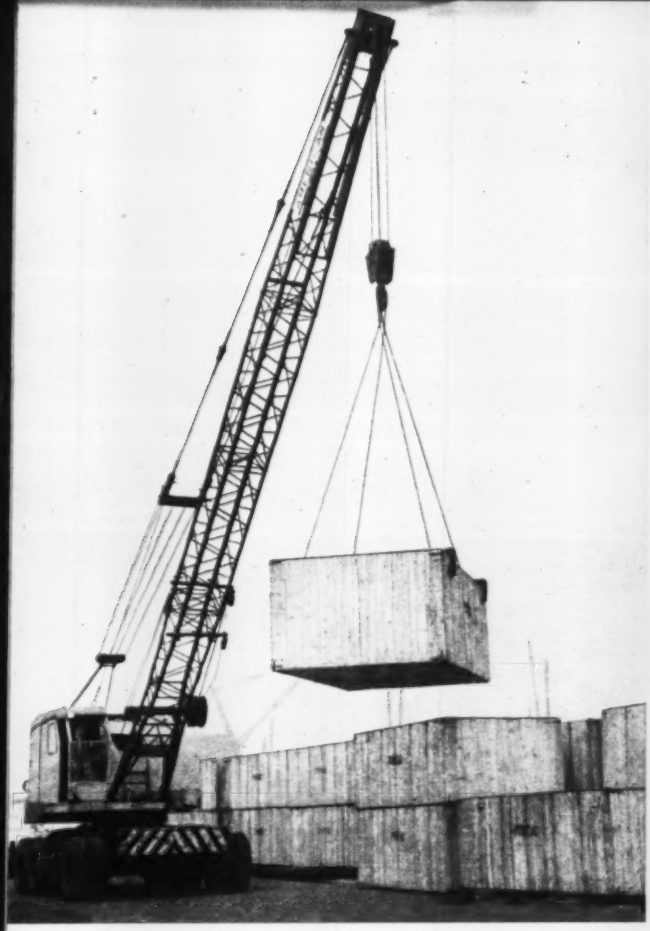
3M Coated Abrasives

"PG" WHEELS

MINNESOTA MINING AND MANUFACTURING COMPANY

. . . WHERE RESEARCH IS THE KEY TO TOMORROW

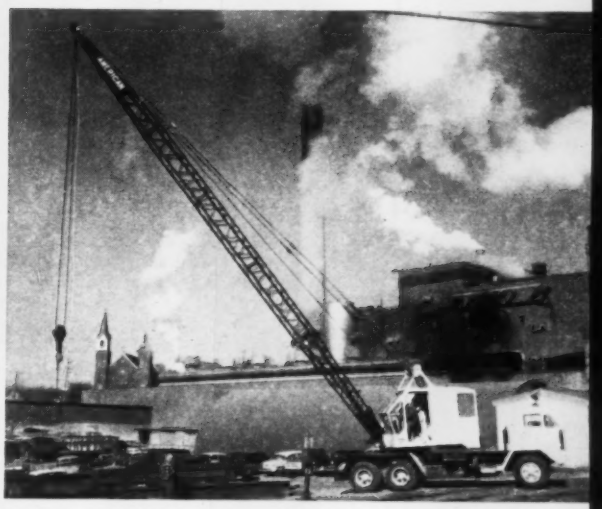
3M COMPANY



This 300 Series Self-propelled yard crane speeds up the unloading of crated autos for export at a Hoboken, N. J. pier.

MATERIAL MOUNTAINS MASTERED WITH AGILE AMERICANS

Crowded, busy yards or plants are a push-over for mobile Americans. Handling costs are shaved because seconds are saved, with the extremely maneuverable American Truck and Self-propelled Cranes. They provide *smoother lifting . . . precision spotting* . . . to help you get more work done in your efforts to keep materials moving.



Ideal for all kinds of yard duties, American 200 Series Truck Cranes are made specifically for tight budgets, tight quarters, tight schedules.

SMOOTHER LIFTING . . . PRECISION SPOTTING

- When you have two speed transmissions on American Truck and Self-propelled cranes you are assured accurate placing of loads without loss of horsepower.
- When the operator changes gears with the control lever, he automatically lowers his line speed, yet retains full horsepower without slipping clutches. This means a smoother swing . . . smoother, safer spotting of maximum loads . . . new control accuracy for steel erectors, bridge builders, shipyards, industrial plants . . . wherever loads need handling with infinite accuracy.
- Next time you see an American on the job, ask the operator . . . ask the owner . . . to show you how Americans are built to give you better service. Then contact your American distributor. He has complete detailed and illustrated catalogue information on American's entire line of crawler or truck crane models, capacities ½-yard, 12½ tons and up.

Serving industry for over 75 years

EXCAVATORS-CRANES to 2 yds.-60 tons
LOCOMOTIVE CRANES to 130 tons
DERRICKS-HOISTS to 800 tons
REVOLVER CRANES to 400 tons

AMERICAN HOIST
and Derrick Company
St. Paul 7, Minnesota

AMERICAN HOIST PACIFIC COMPANY
Special materials handling equipment

CROSBY-LAUGHLIN DIVISION
Drop forged fittings for wire rope-chain

WANTED: more "wife savers"

UNILOY
STAINLESS STEELS

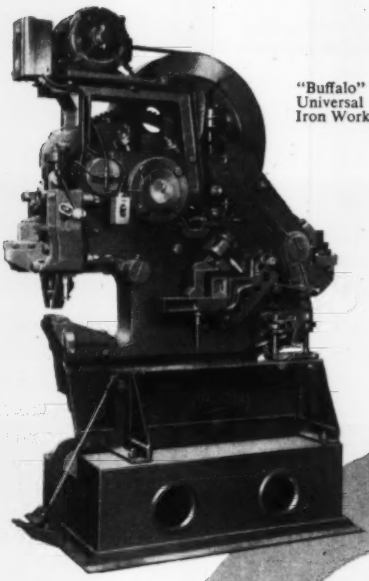
Modern homemakers know that dishwasher detergents cannot mar the gleaming beauty of household items made of stainless steel. That's why sales are soaring in new and growing markets for these attractive, enduring, easy-to-keep-clean "wife savers."

For uniform high quality, lustrous finish and ease of fabrication . . . always specify Uniloy Stainless Steel.

UNIVERSAL CYCLOPS
STEEL CORPORATION
BRIDGEVILLE, PA.

STAINLESS STEELS • TOOL STEELS • HIGH TEMPERATURE METALS

"6-in-1" Machine Pays for Itself—Fast!

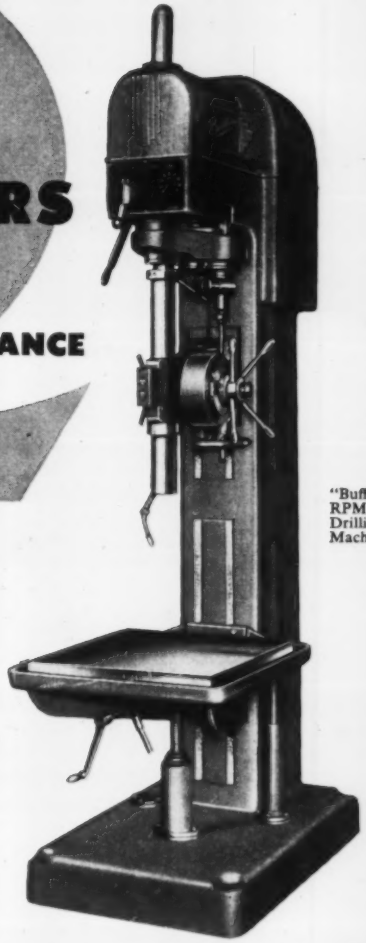


"Buffalo" Universal Iron Worker

For production shops, or for those with maintenance work, the "Buffalo" Universal Iron Worker takes the space of only **one** machine (and requires only a **one**-machine investment) yet it does the work of **six** machines. It's a great space-, time-, work- and money-saver. The UIW rapidly notches, punches, shears, miters, slits, cuts, copes. It handles angles, tees, channels, bars and flats at fast production rates. Performs up to three jobs at once, thus saving time and labor. Ruggedly built with heavy welded steel frame for dependable service. See how the "Buffalo" Universal Iron Worker can save money for you! Write for Bulletin 360-G.

2 MONEY-MAKERS

FOR PRODUCTION OR PLANT MAINTENANCE



"Buffalo" RPMster Drilling Machine

Drilling Speed Changes Unlimited!

Since "Buffalo" pioneered the "RPMster" it has earned an industry-wide reputation as the outstanding variable speed drilling machine. Now, new improvements make this versatile drill even more productive and profitable to use. One is the exclusive "Buffalo" Torque Controlled Power Feed. This permits maximum speed and feed for the size hole being drilled without concern over damage to drill or machine gearing. The "RPMster" has been redesigned for greater capacities, ranging from 1″ to 2″ in mild steel. For a revelation in drilling ease, smoothness and high productivity, be sure to investigate the "Buffalo" RPMster. Write for Bulletin 3257-B.

For complete facts on these "money-making machines", call your "Buffalo" machine tool dealer. Or write us direct.

ESTABLISHED 1877 "Buffalo" MEMBER N.M.T.B.A.

BUFFALO FORGE COMPANY

158 Mortimer St. • Buffalo, N. Y.

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

DRILLING PUNCHING SHEARING BENDING

a.

NEW TITANIUM ALLOYS, IMPROVED PROPERTIES FOR

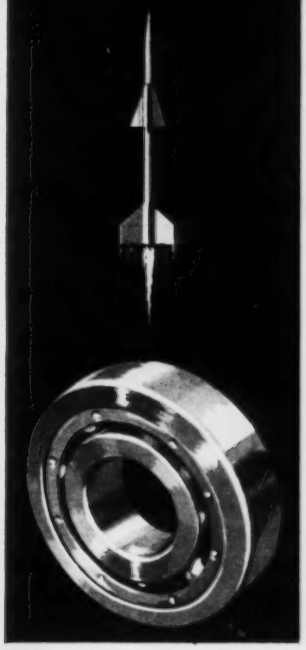
Several new titanium alloys may prove to be the answer to designers' needs for improved tensile and fatigue strength, ductility and corrosion resistance in aircraft and spacecraft materials.

One of the alloys is Crucible B-120VCA. This new, weldable alloy has the highest strength/weight values of any structural material available. At 220,000 psi, its strength/weight ratio is equivalent to that of steel at 360,000 psi. And it maintains its strength/weight advantage for short times at temperatures up to 1400° F. Furthermore, B-120VCA is "Formageable"® (readily formed in the "soft" solution annealed condition and then strengthened by age-hardening).

As this is written, about 50 aircraft and missile manufacturers are testing Crucible B-120VCA samples. They're reporting: (1) it's easier to fabricate than any other titanium alloy; (2) it seems ideal for rocket motor cases, structural members, rivets and other components.

Several other critical design problems are being solved by Crucible vacuum-melted steels and superalloys. Some Crucible alloy and tool steels, for example, possess tensile strengths in the 280,000/300,000 psi range and even higher. Up to now, getting uniform transverse ductility at this strength level has been a problem. Crucible solved it through vacuum melting.

These developments are typical of Crucible advances in specialty steelmak-



a. Lowering a consumable electrode into a vacuum arc furnace. Metals produced by vacuum melting are "cleaner" and therefore offer improved strength, ductility and longer fatigue life.

***b. Titanium,** more than 1000 lbs. of it, saves 800 lbs. in Convair 880 because of metal's high strength/weight ratio. Principal use is in jet engine pods, aileron, stabilizer, and tail assembly.*

***c. Crucible Vacuum-Melted Bearing Steel** makes stronger, longer-lasting bearings. Rejects during manufacture and early failures are virtually eliminated.*

***d. Vacuum-Melted 4340** was specified for hook pivot pin of bomb rack and rocket launcher when air melted steels failed to withstand 4½ hour destructive vibration tests.*

HIGH PURITY METALS PROVIDE MISSILE DESIGNERS

ing. They're possible because Crucible is completely integrated—and because Crucible pioneered in the development of titanium, the high temperature alloys, and in vacuum induction melting and vacuum arc remelting techniques.

Today, Crucible's experience—and newly-increased capacity for vacuum arc remelting of its own special air melted and vacuum induction melted electrodes—provides industry with a complete range of High Purity Metals at lowest cost.

If you'd like to know more about this work, read: "Titanium for Aircraft and Spacecraft" and "Quality Aspects and Engineering Properties of Vacuum Melted Super Alloys and Steels". Write: *Crucible Steel Company of America, Dept. AF15, The Oliver Bldg., Mellon Square, Pittsburgh 22, Pa.*

CRUCIBLE STEEL COMPANY OF AMERICA

PROCESSES

LOOK FOR THE DIAMONDS—SIGN OF FINISHING QUALITY

EQUIPMENT **SUPPLIES**

Now—from Allied Research

—a new systems concept for the finishing of metals.

Process Engineering Service

The first—and only—service built around the most important part of your operations . . . your process requirements.

Why a PROCESS Engineering Service?

Allied Research's long and broad experience in helping customers solve process and equipment problems of all types has led to one important conclusion:

Only by integrating equipment with your particular process are you assured of getting these important benefits from your operations: (1) higher production, (2) greater efficiency, (3) lower operating costs, (4) consistent product quality.

Our success in helping our many customers reach these important objectives has prompted us to offer this unique service to the entire metal finishing industry.

What does our Process Engineering Service consist of?

CONSULTATION—Experienced representatives will assist you in properly planning any part of or all your process and equipment requirements.

RECOMMENDATION—Trained engineers will recommend the particular process, equipment and chemicals to provide you with the best in operating efficiency and economy for your specific production requirements.

INSTALLATION—Planned, engineered and supervised—including plumbing, electrical, ventilation and disposal requirements—or whatever else is needed to assure efficient and proper operations.

SERVICE—Field Engineers insure proper start-up and will make necessary maintenance recommendations. They are available for periodic check-up.

"TURN-KEY" Service—let Allied Research take complete responsibility for laying-out, designing, building, installing and servicing your complete process operations. *Open the door to your plant and start production.*

Get the complete details on Process Engineering Service today. Call your Allied Field Engineer. He's listed under "Plating Supplies and Equipment" in the yellow pages. FREE TECHNICAL DATA FILES on Allied Research processes, equipment and chemicals sent on request.

Allied Research Products, Inc.

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IRIDITE® Chromate Coatings	IRILAC™ Clear Coatings	ISOBRITE® Plating Brighteners	ARP® Chemicals & Supplies	WAGNER Line of Equipment

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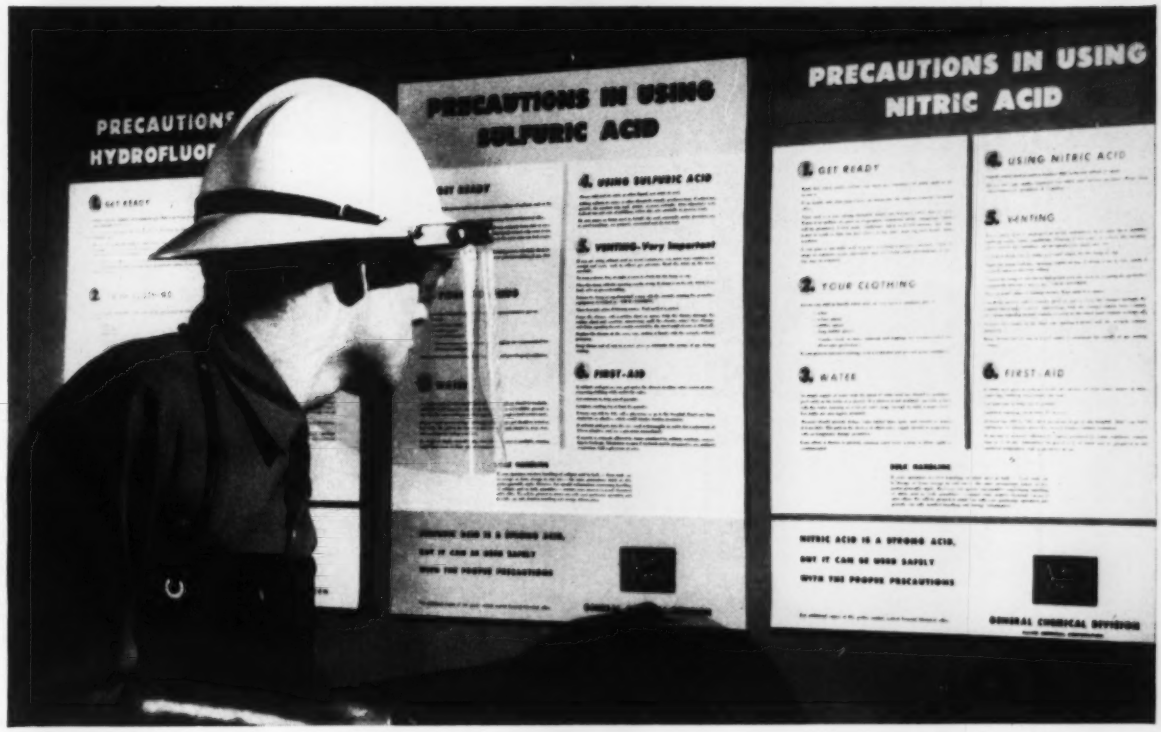


3 New Safety Posters on the Proper Handling of Strong Acids

SULFURIC
HYDROFLUORIC
NITRIC

Here's essential information on how to handle sulfuric, hydrofluoric and nitric acids safely . . . from the people who know them best.

As the nation's leading producer of these strong acids, General Chemical now offers 3 safety posters which spell out the precautions that *must* be taken when handling sulfuric, hydrofluoric or nitric acid. The posters contain such important information as: the proper clothing to wear and the equipment to use; the use of water as a neutralizer; the importance of venting; first aid, and many other necessary precautions.

The posters are free. They are large and easy to read—17 inches wide by 22 inches long. They come complete with metal rims, top and bottom, ready to post in a prominent position in your plant. To obtain any or all three, mail the coupon.

Allied Chemical

GENERAL CHEMICAL DIVISION
40 Rector Street, New York 6, N. Y.

Mail Coupon for Posters!

GENERAL CHEMICAL DIVISION ST-69
ALLIED CHEMICAL CORPORATION
40 Rector Street, New York 6, N. Y.

Please send your free safety posters checked below.

- ☐ Precautions In Using Sulfuric Acid
- ☐ Precautions In Using Hydrofluoric Acid
- ☐ Precautions In Using Nitric Acid

Name_____

Title_____

Company_____

Address_____

City_____ Zone____ State_____

Automotive Power Steering Manufacturer Specifies

OSTUCO *Mechanical Seamless Tubing*

Cold drawing Ostuco tubing through precision ring die on cold draw bench at Shelby mill. Mandrel controls and sizes I.D.

"Automotive components are our business. We have produced literally millions. And we're still learning every day.

"One of the lessons we learned early in the game is that you can't beat Ostuco tubing for surface finish. It cuts our machining costs, keeps us on top competitively.

"There are other reasons, too, why Ostuco tubing tops our preferred list. We like its consistently close tolerances and unvarying quality, shipment after shipment. You might say we like its *product integrity* . . ."

To learn more about what Ostuco tubing can do for *your* production, contact your Ohio Seamless representative, listed in the Yellow Pages, or the mill at *Shelby, Ohio — Birthplace of the Seamless Steel Tube Industry in America.*

AA-9431

OSTUCO TUBING

OHIO SEAMLESS TUBE DIVISION

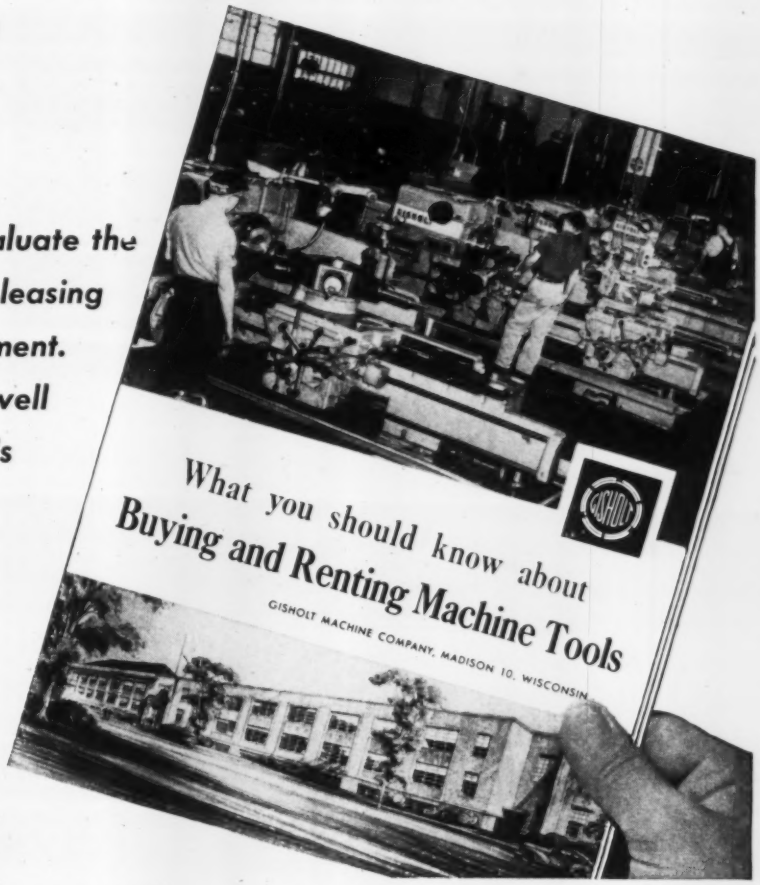
of Copperweld Steel Company · SHELBY, OHIO

Seamless and Electric Resistance Welded Steel Tubing • Fabricating and Forging

SALES OFFICES: Birmingham, Charlotte, Chicago (Oak Park), Cleveland, Dayton, Denver, Detroit (Huntington Woods), Houston, Los Angeles (Lynwood), Miami, Moline, New Orleans (Chalmette), New York, North Kansas City, Philadelphia (Wynnewood), Pittsburgh, Rochester, St. Louis, St. Paul, Salt Lake City, Seattle, Tulsa, Wichita CANADA: Railway & Power Engr. Corp., Ltd. EXPORT: Copperweld Steel International Company, 225 Broadway, New York 7, New York

Can your competitors turn metal at lower costs?

***Now** is the time to re-evaluate the possibilities offered by leasing of new production equipment. Your decision today can well determine your company's position in tomorrow's competitive market.*



This free booklet tells how you can get new machines with minimum capital outlay

If you have delayed replacing old machines because of the relatively large capital investment, acquisition by methods other than outright purchase may solve your problems. Only a minimum initial investment provides you with the many competitive advantages that new machines offer, including greater accuracy, higher production rates and faster setup. New features and accessories simplify even the toughest jobs. Secondary operations are minimized and spoiled work becomes a thing of the past. All this means lower unit cost—more profit for you.

If you want the benefits that new machine tools can provide, and if you like the idea of letting them "pay their way" while they "turn" a profit for you, you'll want to write for Gisholt Bulletin 1173 on buying and renting machine tools. It fully explains one of the most liberal and comprehensive policies in the industry, and covers several types of leasing and time payment plans with vital information on depreciation, tax angles, the MAPI formula and other timely questions. The coupon will bring your free copy. Send it along today.

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Madison 10, Wisconsin

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City.....*Zone*.....*State*.....

COMBINES SUPERB WELDABILITY WITH EXTRA STRENGTH

N-A-XTRA

BEST LOW-ALLOY EXTRA-STRENGTH STEEL YOU CAN BUY

When only the strongest steels will do, specify N-A-XTRA HIGH-STRENGTH. This low-alloy heat-treated steel is now available in minimum yield strengths ranging from 80,000-110,000 psi.

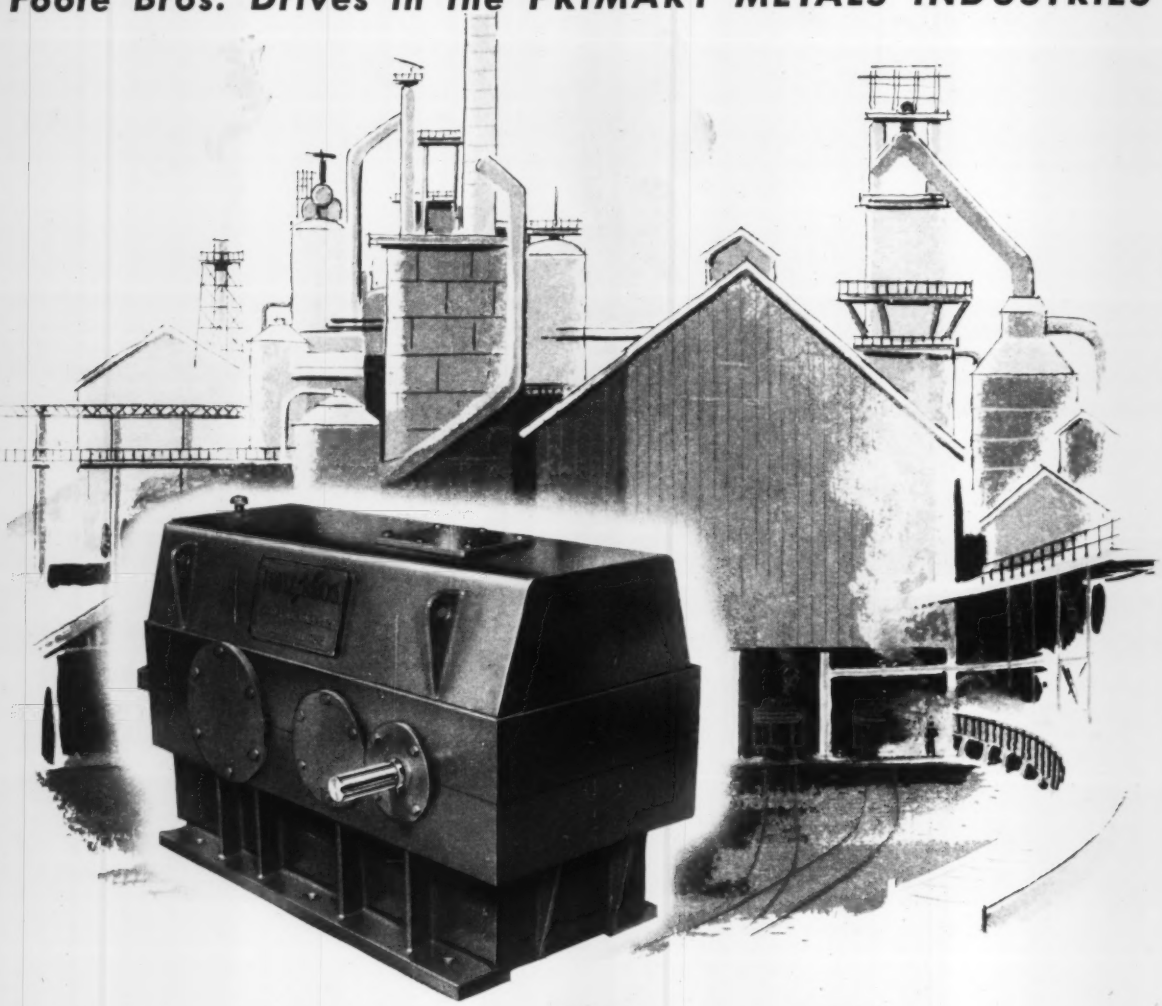
Along with this great strength, N-A-XTRA is readily formed and fabricated. It can be welded by any process. The most drastic welding tests on N-A-XTRA have shown no underbead cracking, even when plate temperatures are as low as —60°F.

Because N-A-XTRA is nearly three times stronger than mild carbon steels, it gives designers an opportunity to eliminate useless dead weight from finished products and realize substantial savings. Let us show you how N-A-XTRA HIGH-STRENGTH steel can do a job for you. Write Great Lakes Steel Corporation, Detroit 29, Michigan, Dept. B-7.

GREAT LAKES STEEL

A DIVISION OF NATIONAL STEEL CORPORATION

Foote Bros. Drives in the PRIMARY METALS INDUSTRIES



ALL STEEL Maxi-Power...

maximum performance drive in a tough steel housing

Add a functionally designed and carefully engineered, high strength fabricated steel housing to the basic heavy duty Maxi-Power Parallel Shaft Helical Gear Drive components, and you get a unit that is capable of resisting severe external impact, in addition to delivering maximum performance.

Maxi-Power Drives are found in the Primary Metals Industries wherever power demands are heavy, and operating conditions require the ultimate in strength, stamina and efficiency.

The heavy, precision machined steel bed of these drives keeps broad faced helical gearing in precise alignment to provide a smooth, overlapping mesh with close backlash tolerances. Tooth deflection is uniform under the heaviest loads. Heavy duty anti-friction bearings are conservatively rated to handle severest shock loads.

Maxi-Power Drives are available in nine combinations of shaft assemblies to permit a variety of gear drive arrangements between the prime mover and driven equipment. Maxi-Power Drives are available in Single, Double, and Triple Reductions. Standard Ratios are from 2.08 to 1 and up to 360 to 1. Capacities to 1550 HP.

Why not get the complete story on Maxi-Power soon? Write for Engineering Manual MPB and full details on the All Steel Drive today.

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IN ONE FAST, EASY OPERATION, Houghto-Clean "Cold" Cleaners remove shop dirt and cutting oil—do *not* affect paint. These safe, long-lasting cleaners eliminate costly multi-stage cleaning, operate without foam and fumes. Heat generating equipment is not needed, shops stay cooler, parts handle more comfortably.

Houghton's Full Line of Cleaners

In addition to Houghto-Clean room temperature Cleaners, modern Houghton chemistry is producing a complete line of cleaners to speed and simplify the full range of industrial metal cleaning.

Call the Houghton Man in your territory for practical, cost-cutting recommendations for your particular cleaning requirements.

Write for the new booklet, "Metal Cleaning Compounds by Houghton" which describes all these and more, made to serve you. E. F. Houghton & Co., 303 W. Lehigh Ave., Philadelphia 33, Pa.

CHECK YOUR CLEANING NEEDS AGAINST THESE MODERN HOUGHTON CLEANERS

- ☐ **Room Temperature Cleaners . . .** Houghto-Clean 400 Series
- ☐ **General Purpose Tank Cleaner . . .** Houghto-Clean 240
- ☐ **Power Washers . . .** Houghto-Clean 205 or 270
- ☐ **Aluminum . . .** Houghto-Clean CS
- ☐ **Emulsion Cleaner . . .** Houghto-Clean 220
- ☐ **Salt Bath Cleaner . . .** Houghto-Clean 245 and/or Cerfak Liquid
- ☐ **Acid Phosphate Cleaner** (prior to painting) . . . Houghto-Clean 313-A

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Ready to give you on-the-job service

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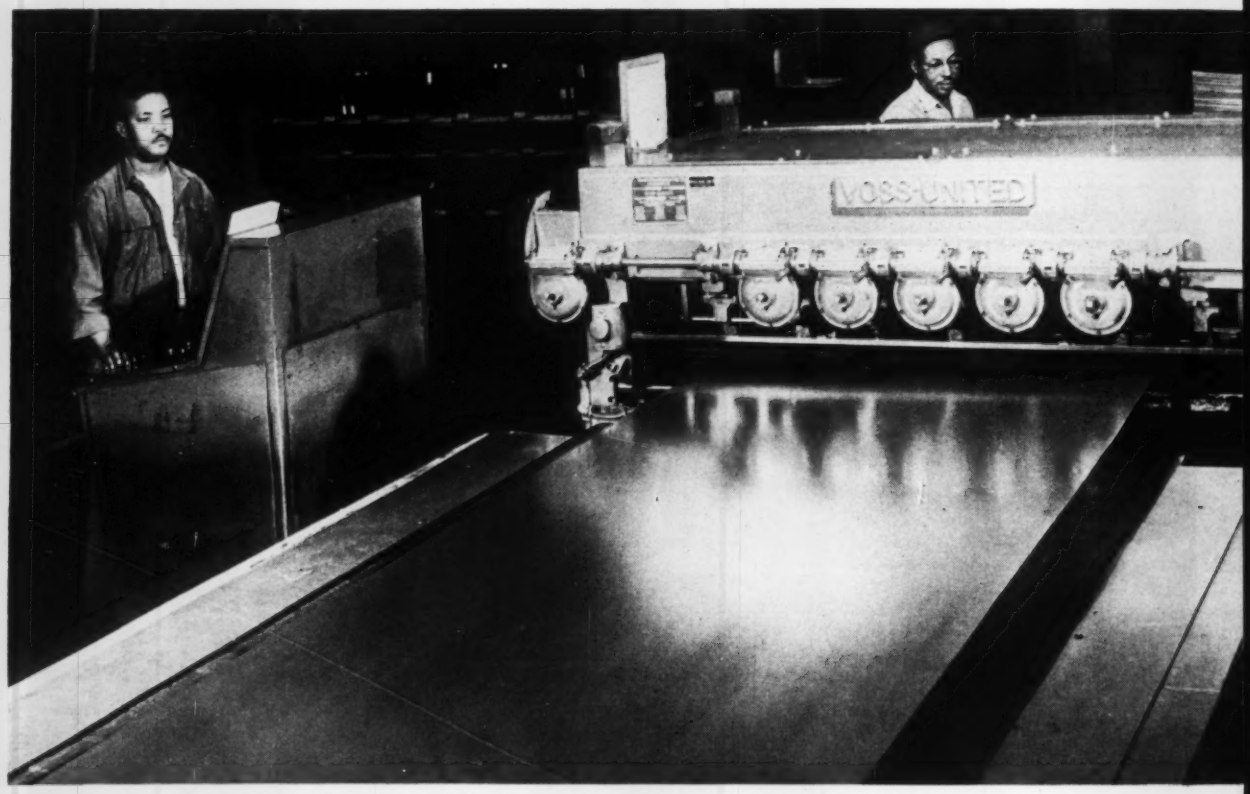
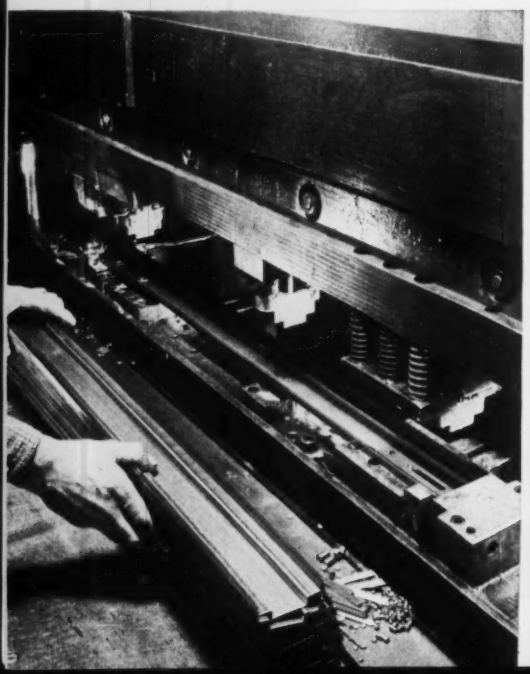
Pittsburgh Steel Sheet Used . . .

Where Flatness Makes Good Steel

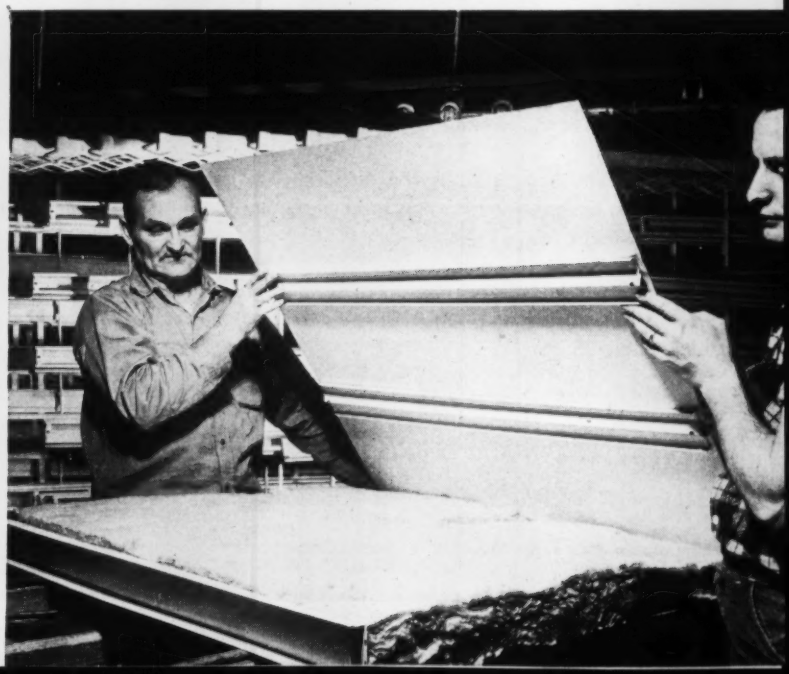


Roller leveling to achieve dead flatness is easy with Pittsburgh Steel Co. Sheet, says The E. F. Hauserman Co.

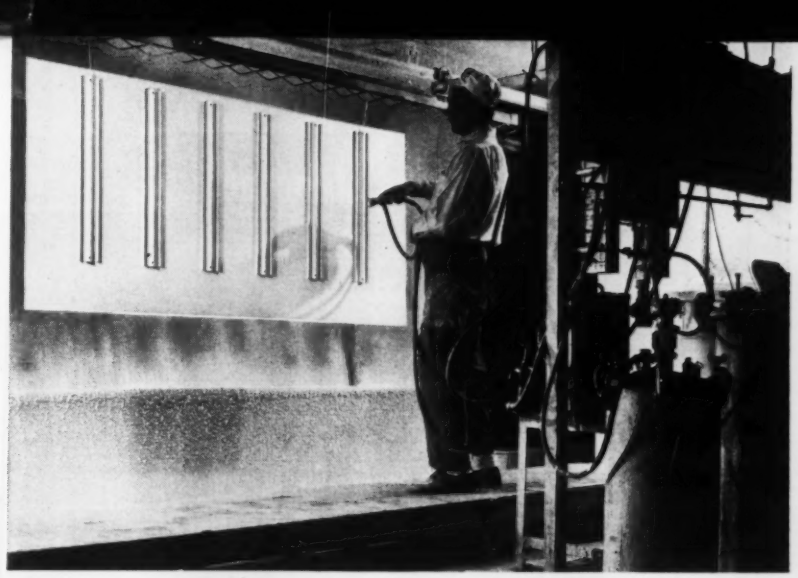
A vertical member, showing sharp corners and severe bends, is embossed and punched on this 500-ton Cincinnati press brake.



Assembly for a flush steel and glass panel is being completed here. Rock wool batting provides sound control and insulation. Note reinforcing ribs on back of panel being placed on "sandwich."



Sandwiches



Paint line shows partition panel measuring 7 feet by 36 inches getting a primer coat. Good surface of Pittsburgh Steel's sheet shows up here where any flaws would mar paint job.

E. F. Hauserman hates ripples . . . The E. F. Hauserman Co., that is.

The Cleveland firm, world's largest producer of movable, interior walls, hates ripples because any kind of ripple in a wall panel is very visible to the eye. The slightest ripple produces a pattern of light and shadow.

To avoid rippling walls, The E. F. Hauserman Co. uses large quantities of cold rolled sheet steel from Pittsburgh Steel Co. because it's easy to achieve dead flatness with Pittsburgh Sheet.

Pittsburgh Steel Co. is one of the leading quality producers of cold rolled sheet steel—the most important raw product in the Cleveland plant. Hauserman must have flat panel plates which can be roller leveled to dead flatness. Sheet provided by Pittsburgh Steel helps achieve dead flatness with a minimum of processing.

The Hauserman company designs, engineers, manufactures and erects movable interior walls for commercial, industrial and institutional buildings on a nation-wide scale. Steel partitions provide greater movability, better appearance, lower maintenance, earlier occupancy, good access for utilities, efficient sound control, fire safety, greater rigidity and low cost through use of economical steel.

Typical installation of a Hauserman movable wall can be made without chasing occupants out of offices.

• **Gage**—Hauserman watches gage very carefully. Their Wean slitter is equipped with an Easterline-Angus electronic recording device which makes a written record of every inch of sheet processed. Pittsburgh Steel meets specifications for gage consistently.

• **Formability**—While flatness is a prime consideration, Hauserman also insists on excellent formability in sheet steel.

A great variety of formed parts, including cornices, inner bases, post caps, bases, spreader channels and reinforcing ribs, are made with severe bends and sharp corners. In some parts a lip of steel is bent back on itself through a 180-degree angle.

Because cold rolled sheet supplied by Pittsburgh Steel takes these strains without rips or tears, Hauserman has less scrapped material.

• **Surface**—Steel panels get three in-process inspections to make sure surfaces of panels and component parts are free of flaws. Defect-free surfaces make it possible for Hauserman to spray paint with assurance that the paint job won't be marred by flaws showing through.

• **Weldability**—Finally, Hauserman demands good weldability. Component parts and assemblies are fastened by both flash and resistance spot welding. Pittsburgh sheet makes a better product and reduces operating costs by taking a good weld without slowing production.

When a sheet user as exacting as The E. F. Hauserman Co. finds Pittsburgh Steel Co. sheet meets requirements consistently, you and other sheet users can confidently order from Pittsburgh Steel. Whatever your requirements may be—flatness, formability, surface, uniformity in gage, weldability or deep drawing quality—you'll benefit from putting Pittsburgh Steel sheet on your production lines. Trained personnel is available to help with any steel problem. Call a Pittsburgh Steel man today. You'll find him in any of the district offices listed below.

Pittsburgh Steel Company

Grant Building • Pittsburgh 30, Pa.

DISTRICT SALES OFFICES

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Chicago	Dayton	Houston	New York	Tulsa
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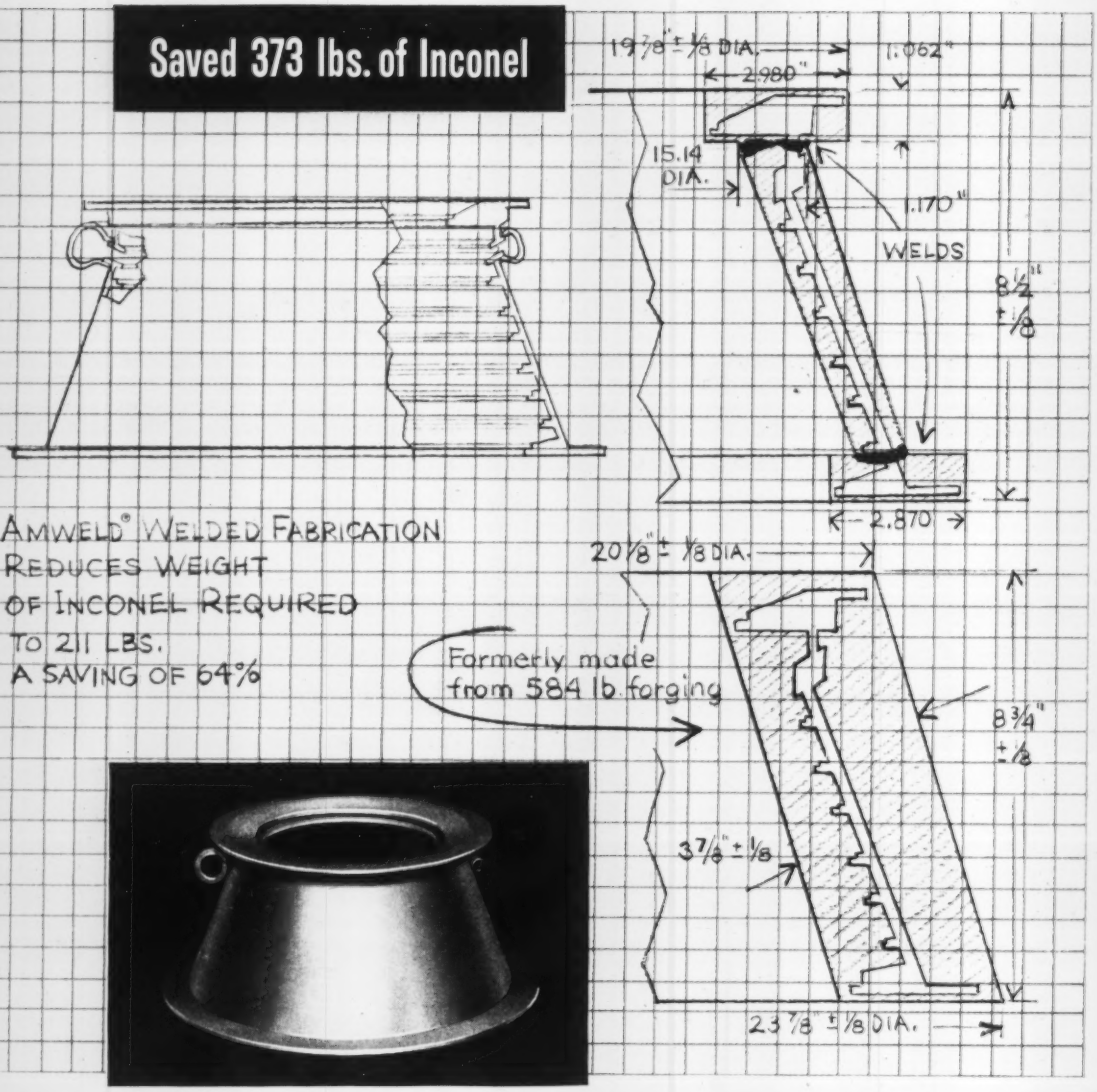
Saved 373 lbs. of Inconel

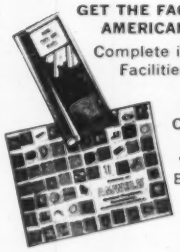


Flash Butt-Welded Ring Assembly Replaces Heavy Forging
SAVES $820.60 on Jet Turbine Casing

This jet engine turbine casing is now produced by Amweld from 3 flash butt-welded rings circumferentially welded together. The result: $820.60 in expensive metal saved on each assembly . . . plus additional savings in machining.

Perhaps Amweld's 40 years' welding experience and special skills in working with hard-to-weld metals can help you solve a fabricating problem.

Send for new catalog of Amweld Welded Precision Assemblies and our instructive booklet, "How Amweld Flash Butt-Welded Rings are Produced." Better yet, mail us your prints and specifications. We will study your problem and work with you.



GET THE FACTS ABOUT AMERICAN WELDING

Complete information. Facilities brochure, Precision Assemblies Catalog, and booklet on "How Flash Butt-Welded Rings are Made."

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AMERICAN WELDING

Cost Control Is Keynote at AISI Meeting

Benjamin F. Fairless, president, American Iron & Steel Institute, expressed the main theme of this year's AISI meeting this way: Steelmakers must keep costs under control if they want to meet mounting competition from foreign steel producers and domestic makers of competitive materials (Page 45). George M. Humphrey, chairman, National Steel Corp., asserted: "You must stay active in politics if you want to stay active in business." A. F. Franz, president, Colorado Fuel & Iron Corp., attacked inflation.

Here's Ray of Hope for Depreciation Reform

Joel Barlow, U. S. Chamber of Commerce taxation committee chairman, says a meeting will be held in Washington June 11 for all associations and chamber members interested in depreciation problems. Current proposals for reform will be considered. Out of the meeting may come a "unanimity of purpose," suggests Mr. Barlow. (One stumbling block in the path of reform is a disagreement among businessmen as to the type of plan they would like.) Congressional interest in the meeting is assured by Rep. Wilbur Mills's (D., Ark.) announcement of an "extensive inquiry" into tax problems in November. He's chairman of the House Ways & Means Committee.

Third Quarter Outlook: Good

Here's how manufacturers of durable goods, surveyed by Dun & Bradstreet, see this year's third quarter (vs. last year's like period):

Per cent expecting:	Net Sales	Net Profits	Selling Prices	Number of Employees	Level of Inventories	New Orders
Increase	81	70	31	28	41	70
No change	17	28	67	70	52	27
Decrease	2	2	2	2	7	3

Why Steelworkers Are Unemployed

Roger M. Blough, chairman, U. S. Steel Corp., using union figures as a base, shows why employment in the steel industry is failing to keep pace with the nation's recovery: From 1948 through 1957, U. S. net exports of steel averaged 2.9 million tons annually; 1 in 7 USW members owed his job to exports. Last year, net exports fell to 1.4 million tons. Half the men who owed their jobs to exports were left without work. Now the U. S. has become, for the first time, a net importer of steel. So all the men who counted on exports for jobs, plus some who depended on domestic sales, are without job security. The reason: Compare Germany's Phoenix Rhein-Rohr with America's Wheeling Steel. The American worker turns out 1½ times as much steel as his German counterpart; but his wages and benefits

cost 3½ times as much. So unit employment costs are nearly 2½ times as much for American steel as for German steel.

Who Are America's Unemployed?

Of the 3.6 million Americans unemployed in April, 2 in 5 were unskilled or semiskilled operatives, 1 in 5 was a Negro, 4 in 10 have been out of work 15 weeks or longer, 3 in 5 were protected by unemployment compensation. About 5.3 per cent of the labor force were out of work in April vs. 7.5 per cent a year ago, and 4 per cent in April, 1957. In durable goods manufacturing, employment is 700,000 higher than a year ago, but still 650,000 below two years ago. One in 12 autoworkers is still looking for a job.

Why and How States Woo Industry

Gov. Cecil Underwood's traveling salesmanship has helped West Virginia claim 143 new plants with a capital investment of over $1.4 billion since 1954. He's one of many state chiefs devoting more time to wooing industry in an attempt to gain or maintain fiscal stability. Recent years have seen tremendous shifts in plant locations. As a metalworking manager, you'll probably help pick a plant site some day. You'll be better prepared for the job if you learn how to evaluate state claims, analyze the tons of statistics and propaganda they'll feed you, and know what points are most important and how to weigh them (Page 52).

GM Wants Subpoena Quashed

Bruce Bromley, counsel for General Motors Corp., is asking a federal court to void a Justice Department subpoena for GM records dating back to 1929. The government is probing for possible violations of antitrust laws. Mr. Bromley contends that the records being sought are "so broad as to constitute unlawful search and seizure." He says the government wants them "with the obvious hope that some possible criminality may be dredged up."

Metal Moves Deeper into Housing Market

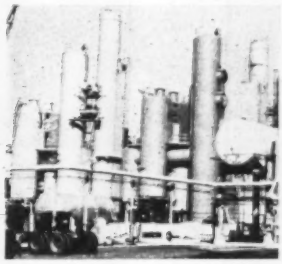
Expect metalworking's sales to the home-building industry to set a record this year. More houses are being built and more metal is going into the average house. Count on a market for about 1.4 million houses annually through the early 1960s. Don't expect too liberal a housing bill from Congress this year if President Eisenhower objects. He has been assured that the bill would not pass over his veto (Page 50).

Electronics People Look for Spectacular Growth

Spurred by $5 billion worth of military sales, the electronics industries look for record shipments of $9 billion this year. The Electronic Industries Asso-

ciation predicts military sales will exceed $21 billion in 1970. The missile market, worth $306 million in 1955, hit $1.5 billion in fiscal 1959, and may reach $2 billion by fiscal '60. By 1965, semiconductor makers expect their sales to reach $1 billion.

Steelmakers Will Boost Oxygen Needs



Expect the steel industry to continue hiking its oxygen requirements. It'll use more than half the 80 billion cu ft produced this year. The average steel plant uses 391 cu ft per ton of ingots produced (Page 119). Oxygen consumption for open hearth roof jets, the biggest single metallurgical use today, is increasing sharply. Basic oxygen steelmaking shows tremendous potential.

Two Steel Mills Will Be Transplanted

Workmen are dismantling a steel mill formerly operated by Seidulhuber Steel Rolling Mills Corp., Seattle, for shipment to Turkey. The electric furnace and rolling mills will be shipped to Istanbul in August . . . Another entire steel mill will be transplanted in Regina, Sask., from Wales this summer. It'll make steel products for the Canadian oil industry.

You Can Expect More Competition

Look for the number of businesses in the U. S. to increase around 2 per cent this year. There were 4.6 million operating establishments at the beginning of this year—1.25 per cent more than a year earlier. New incorporations are at record highs and business failures are low. During April, 17,554 new incorporations were chartered—55 per cent more than a year earlier. Business failures totaled 1292—11 per cent below a year earlier, reports Dun & Bradstreet.

How to Get Thicker Coatings on Metal

Now you can deposit 0.004 in. coatings of aluminum or cadmium on steel or aluminum parts. The key: A new vacuum metallizing process (Page 96). The deposits are strong, ductile, nonporous, and won't affect the tensile strength of the base metal. Corrosion resistance equals that of solid aluminum or cadmium. Cost: Around 10 cents a sq ft for large volume parts. The process was developed by National Research Corp., Cambridge, Mass.

How to Put Yourself Out of Business

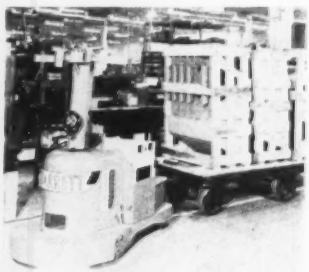
Here are 14 ways to lose business fast (outlined by National Screw Machine Products Association members): 1. Allow labor costs to rise too high. 2. Condone absentee management. 3. Fail to plan for long range growth. 4. Limit sales to too few companies. 5. Set prices too low or too high. 6. Gam-

ble with a government job without a clear idea of what is expected. 7. Fail to keep up to date in research, engineering, or modern equipment. 8. Make errors estimating raw materials or price. 9. Fail to delegate authority. 10. Forget about customer relations. 11. Refuse to give design assistance. 12. Make late deliveries. 13. Don't use modern production planning methods. 14. Have poor quality control.

What'll You Do Ten Years from Now?

You'll watch intercontinental TV programs on your mural TV set; your house will feature thermoelectric appliances, luminescent lighting, and atomic power; you'll work in a fully automated factory; supercomputers will handle paperwork; your products may be shipped on gas turbine trucks; you'll see continuous steel casting; and you may hop a spaceplane to the moon. Those are predictions of James H. Jewell, vice president-marketing, Westinghouse Electric Corp.

What's New in Material Handling



This Barrett-Cravens operatorless tractor can be tape controlled to carry out repetitive operations like starting, stopping, and uncoupling trailer cars. It's one of many new developments in material handling. Equipment makers are offering new features to eliminate unnecessary handling, move products faster, and use space better. Such machines will be displayed at next week's Material Handling Exposition in Cleveland (Page 92).

Who'll Win the Battle of Ogden Dunes?

Odds are that the three steelmakers—National, Inland, and Bethlehem—that own land at Ogden Dunes (a tiny community on the southern tip of Lake Michigan) will be allowed to build plants there—despite some objections from the town's politicos. The town annexed National's 800 acres, tried to tie up Inland's 275 but ran into a restraining order which also protects Bethlehem. Another rub is involved: Sen. Paul Douglas (D., Ill.) is pushing a bill to create a national park in the area. Says one of his assistants: "We're for steel and jobs, but we think you should be a little more selective in your choice of area. Maybe we need more recreation centers and fewer psychiatric wards." Asserts National's George Humphrey: "It seems to me that jobs are more important than picnics."

Straws in the Wind

The value of U. S. commercial exports dropped $25 million in April (vs. March), reports the Commerce Department . . . Net new orders for machine tools rose to $53.4 million in April from $51.5 million in March . . . The Labor Department guesses that the average B.A. graduate this June will get a starting salary of $425 a month; about 40,000 engineering grads will average $500 a month . . . The Atomic Energy Commission awarded Kaiser Engineers Div., Henry J. Kaiser Co., a $100 million contract to build a plutonium reactor . . . Teamster union boss, James Hoffa, pledged that his union would support the steelworkers in event of a strike, but he didn't say how.

Most complete steel-service centers

in principal cities coast to coast

LARGEST STOCKS

Year in and year out Ryerson stocks are by far the largest in the nation —and today they are at an all-time high in size and diversity.

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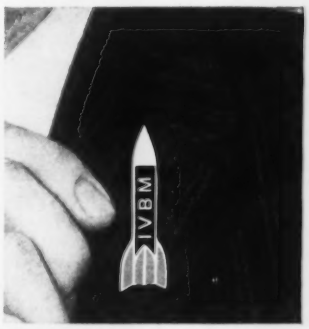

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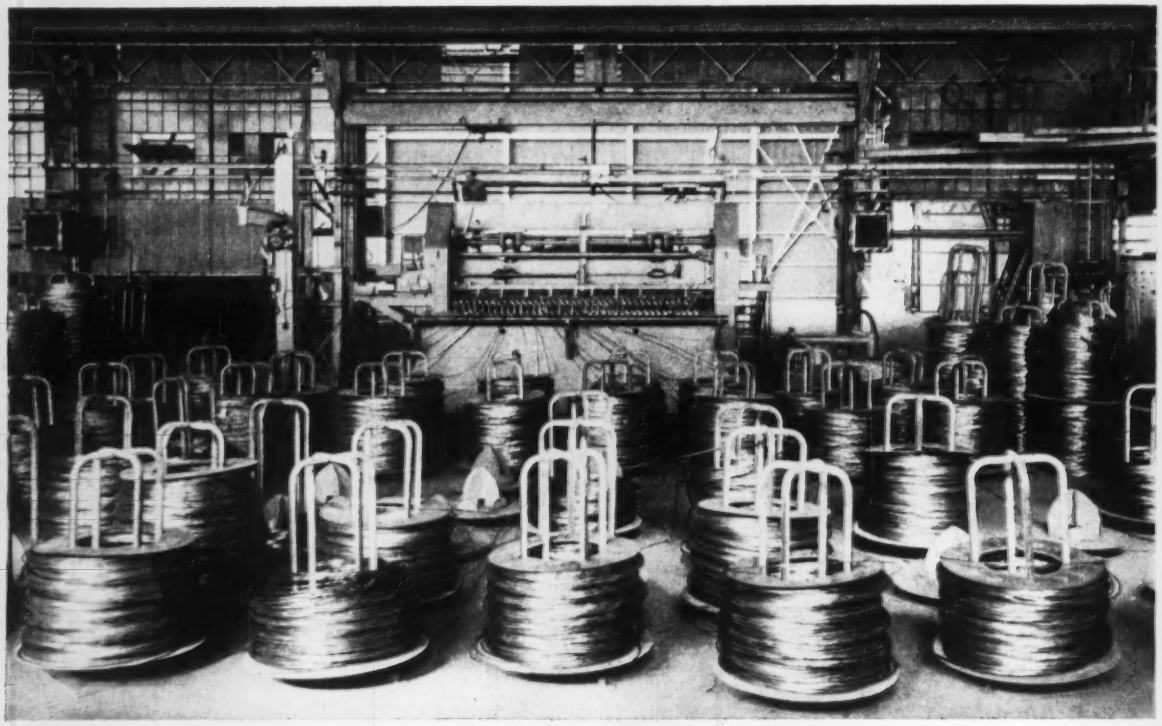

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Look closely at the entry side of this giant Welded Wire Fabric machine. This one produces mesh in widths up to 13', used for reinforcing concrete in road, pipe and other construction. Fed by as many as 80 - 3,000 pound Brite Wire LPR's running simultaneously off as many reels, it produces rolls from 300' to 500' long, weighing up to about 6,000 pounds. The flat mats or sheets run up to 30' long.

In the photograph at the right, you see the delivery side of the welder, shear in the background, coiler in front and, in between, the fully automatic "flipper" and piler . . . the only one of its kind, we are told.

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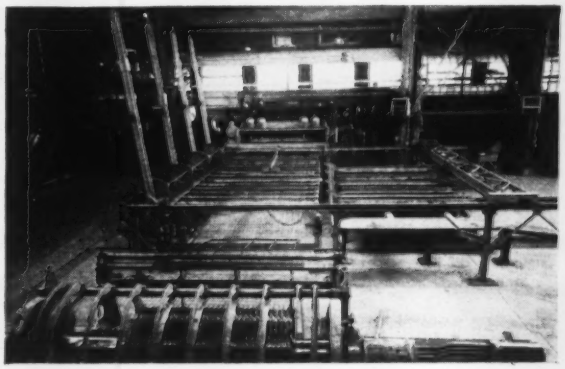

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No One Wins a Steel Strike!

After nearly four weeks of negotiations between the Steel Companies Co-ordinating Committee and the United Steelworkers of America, the outlook for a new wage agreement by June 30 looks hopeless.

Both sides—through newspaper advertising and from the public speaking platform—have established positions so immovable that many people think that the strike will not last 30 days, or 60, but 100.

The Co-ordinating Committee proposes the continuance of present wages and employee benefits for one year.

The union wants more than the 62½ cent package it got in 1956—including higher wages, shorter hours of work, cost of living adjustments, weekend premium pay, and upward revisions in Supplemental Unemployment Benefits, insurance, and premiums.

In reaching a compromise, the negotiators will need to keep in mind these facts:

That U. S. Steelworkers are now the highest paid in the world. (They get $3.60 an hour—a base wage of $3.03 and benefits of 57 cents.)

That wage rates have been rising faster than productivity.

That workers fear unemployment, which has continued at a high level even in a period of prosperity.

That workers are interested more in full-time work and job security than higher wages with some part-time work.

That steel industry profits are higher. But taking depreciation into account, they still aren't high enough to generate the capital needed to replace worn-out equipment.

That the steel industry is pricing itself out of the world market for steel. Since December, the U. S. has become a net importer of steel.

That the heavy flow of gold out of the country has renewed speculation that the U. S. will be obliged to devaluate the dollar.

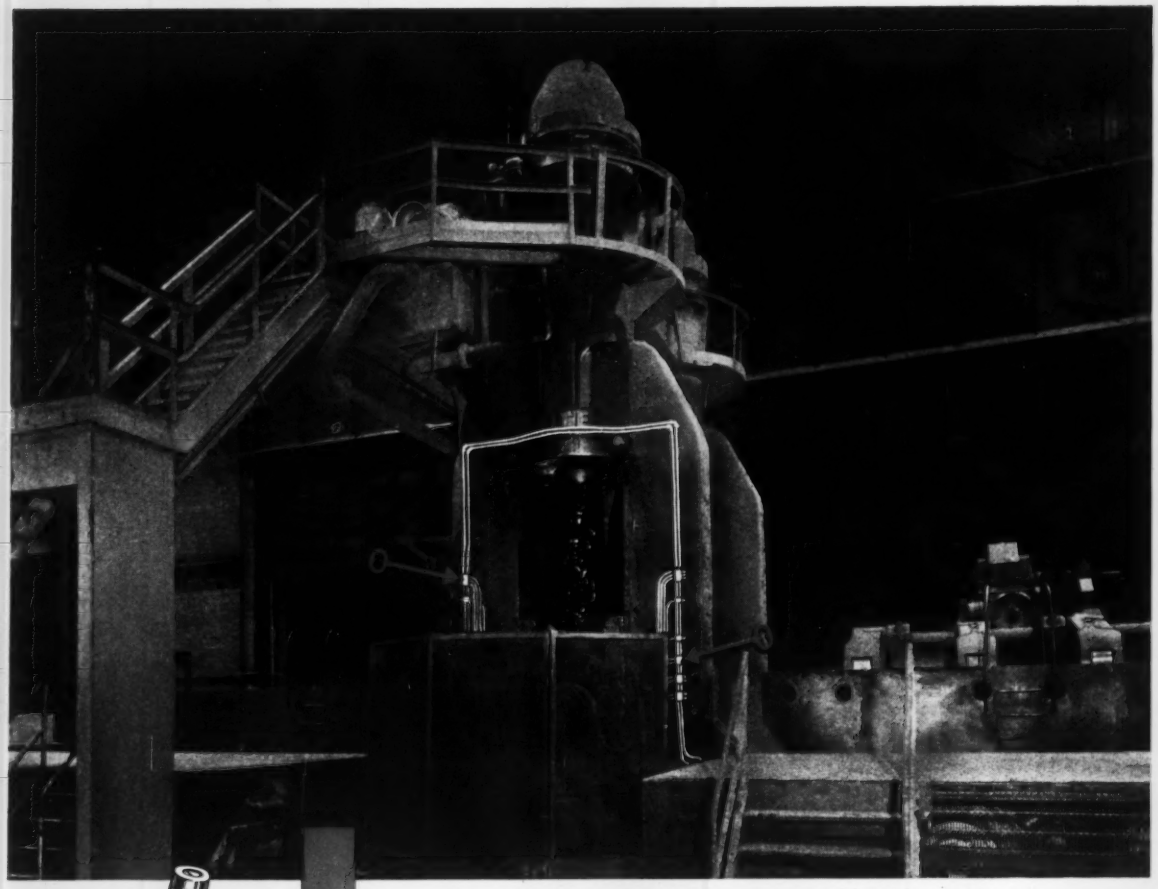
Somewhere along the line, the Steel Companies Co-ordinating Committee will need to give a little. The USW will need to give a lot.

We think the settlement should come before the June 30 deadline. What is happening now is not good for the workers, the industry, or the country.

No one wins a steel strike.

Irwin H. Such

EDITOR-IN-CHIEF



FARVAL
—Studies in
Centralized
Lubrication
No. 240

Farval automatic systems lubricate Geneva Works 45-inch slabbing mill

The fast and synchronized action of this 45-inch slabbing mill at the Geneva Works of Columbia-Geneva Steel Division, U. S. Steel Corporation depends to a large extent on properly lubricated bearings. Sixteen Farval systems automatically lubricate more than 1,000 bearings throughout the slabbing mill. Other Farval systems serve more than 6,000 bearings at the Geneva Works. Lubricant in the correct amount is delivered at regular intervals under the most rugged conditions and combinations of heat, shock and vibration.

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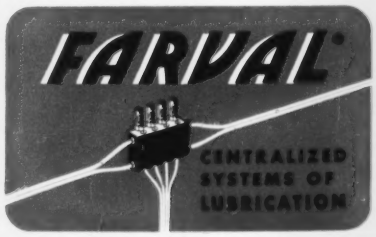


AISI Speakers Stress Cost Control

IMPORTS of steel are exceeding exports. Our inability to meet prices of foreign competitors is costing industry dearly in tonnage and revenues. Our employees are feeling the effects in fewer hours of work and loss of jobs. Foreign technology compares favorably with our own while foreign wage levels are far lower than ours.—Benjamin F. Fairless, president, AISI.

"INFLATION has brought increasing costs, a rapid growth in foreign competition, inadequate depreciation allowances, and . . . migration of American business."—A. F. Franz, president, Colorado Fuel & Iron Corp., Denver.

"YOU MUST GET ACTIVE in politics if you want to stay active in business. Politically determined costs can price you out of your better markets. Politically determined regulations can restrict your exports and increase competitive imports. Bills are being urged in Congress that affect both your wage and pricing policies."—George M. Humphrey, chairman, National Steel Corp., Pittsburgh.

"MONOPOLY UNIONISM must be exposed. We must point out (to the public) that racketeering, conspiracy, lawlessness, and contempt of the public generally are the consequences of monopoly power."—E. J. Hanley, president, Allegheny Ludlum Steel Corp.

Those were the themes of the key addresses at last week's American Iron & Steel Institute meeting in New York.

Steelmen Must Control Costs

Mr. Fairless told steel executives they must hold costs down and improve technology if they intend to keep foreign steel and competitive materials from cutting deeper into

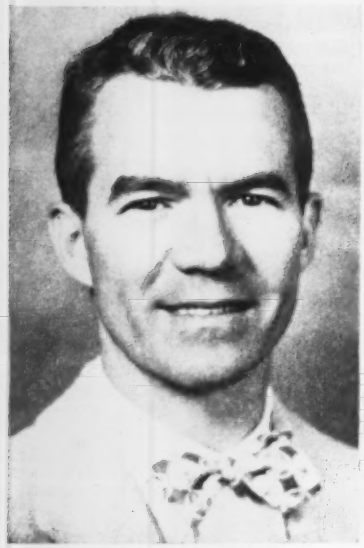
BENJAMIN F. FAIRLESS
President, AISI

A. F. FRANZ
President, Colorado Fuel & Iron Corp.

GEORGE M. HUMPHREY
Chairman, National Steel Corp.

E. J. HANLEY
President, Allegheny Ludlum Steel Corp.

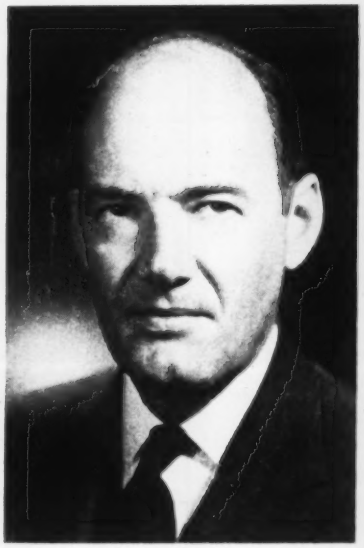
AISI Award Winners



LYNN S. BEEDLE
Lehigh University

JOHN D. SAUSSAMAN
Kaiser Steel Corp.

—Regional Technical Meeting Awards—



DAVID S. HOLBROOK
Algoma Steel Corp. Ltd.

—Institute Medal—

their markets. " I favor high wages, but I don't want to see American steelworkers price themselves out of the market," he said.

High tariffs are not the answer, believes Mr. Fairless. He thinks American steelmen should support practical efforts to raise the standard of living in foreign countries. Higher living standards with higher wages will be an effective weapon against Communism and ultimately help even up competition—if further increases in American steel production costs can be avoided, contends Mr. Fairless.

• **Foreign Threat Grows**—The St. Lawrence Seaway is bound to heighten competition as more foreign steelmakers take advantage of low transportation costs to the Midwest. Such cities as Chicago, Cleveland, Detroit, and Buffalo will become busy seaports. Elimination of overland transportation will allow foreigners to undersell Americans by an even greater margin than now prevails, says Mr. Fairless.

• **Facing the Problem**—He recommends that the industry allocate a percentage of annual steel production for export. That would assure foreigners of continuing supply.

Modernize Facilities

Mr. Franz suggests this plan of attack to meet competition: 1. Modernize plant and equipment to take advantage of new technology. 2. Hold down operating costs.

Modernization requires large investments. They should come, in great part, from depreciation reserves, he declares. "But those are inadequate, due to inflation and lack of changes in tax laws which are long overdue. A realistic tax policy should be adopted to permit us to recover the purchasing power of our original investments." Plant modernization is of paramount importance to smaller firms, he contends.

"That's something Congressional investigators don't seem to realize," says Mr. Franz. "In their efforts to bring pressure on the industry to hold prices down, they direct their attack against companies that have had the capital to invest in new facilities and have reaped the rewards of modernization."

Mr. Franz says this about companies that have built plants abroad: "They have apparently concluded that a combination of American productive efficiency and foreign wage rates might provide a solution to at least some of their problems. American-owned facilities abroad now total about $8 billion."

Fighting inflation is the responsibility of labor and the public as well as management, Mr. Franz concludes.

Take Part in Politics

"The largest items in your cost sheet are fixed for you by political decree," contends George M. Humphrey, chairman, National Steel Corp., Pittsburgh. Managers must take a more active part in politics if they want a healthy business climate, he believes.

He warns management: "You are being challenged by highly organized groups that are strenuously devoting themselves to politics. They have a good start. Well funded labor groups are hard at work, seemingly without full realization of the disastrous consequences (it will have) to themselves (if they) fail to heed the simplest principles of competition."

Mr. Humphrey points out that it is proper for executives to inform their employees and stockholders, at corporate expense, where their interests lie. "Their broad understanding will be a mighty force," he believes.

And Curb Union Power

The problem of monopolistic unionism must be solved before "we can confidently take off on the next cycle of economic growth," asserts Mr. Hanley.

He describes monopolistic unionism as the exclusive privilege of certain individuals and organizations to organize and control groups of workers.

That's the situation among production workers in numerous industries today, Mr. Hanley declares.

About 99 per cent of autoworkers are UAW members, 96 per cent of rubber workers belong to URW, 98.7 per cent of steel employees are USW members, and 99.4 per cent of printing people are union members. That list could easily be extended, says Mr. Hanley.

Threatened interunion agreements, if consummated, would enable one or two men to wield the greatest power ever seen in this country, he adds. An evidence of union monopoly power is the imposition of pattern settlements, brought about by divide-and-conquer tactics (as in the auto industry) or the industry-wide approach (as in steel, glass, cement, rubber). "The Taft-Hartley Act . . . has had no real effect on the growing power of unions," asserts Mr. Hanley.

Some progress has been made in showing what monopoly unionism is, reports Mr. Hanley. "The wage-push inflation has been highly revealing; it has placed the public spotlight on one of monopoly unionism's principal consequences." But more must be done toward arousing the public to pressure Congress to apply the antitrust laws to monopolistic unions, he contends. "Then, and only then, will we strike at the roots of the problem."

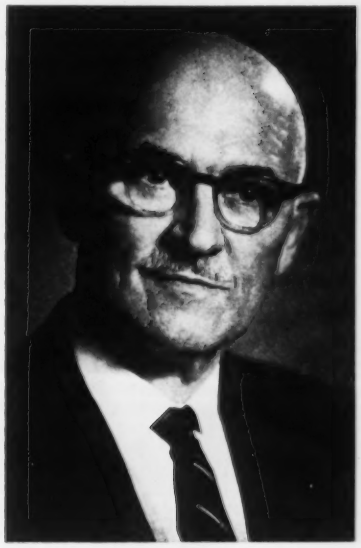
Russia Can Set Pace

The Russian steel industry is in a position to set the competitive pace anywhere in the world, contends F. M. Rich, vice president-operations, Inland Steel Co., East Chicago, Ind.

"It's like one big company," reports Mr. Rich. He was a member of the steel delegation to the Soviet Union last year (headed by Edward L. Ryerson, honorary director of Inland).

AISI Technical Session Speakers

F. M. RICH
Inland Steel Co.



J. S. McMAHAN
Steel Co. of Canada Ltd.

The Soviet state has power to manipulate wages, prices, production, and distribution, without regard to customer needs, he reports. "The Soviet steel industry is operating and expanding on a strong and intelligent basis. It has capable, experienced, and dedicated leaders. The workers are well trained and work hard for high production. Facilities are well designed, constructed, and operated. Raw material reserves are tremendous. The Soviet government's already substantial military power is being increased by a rapidly growing industrial capacity."

Mr. Rich suggests six ways to meet the Soviet challenge:

1. The American steel industry should encourage the widest possible exchange of delegations between our two countries. The key men . . . in the Soviet Union . . . must be shown that an economic system based on consumer demand and private ownership has produced a far better life than one based on enforced quotas and state ownership.

2. A sound and farsighted basic research program should be developed for the American steel industry. AISI should help organize and guide it. First we must hold wages in line. Then we must improve the efficiency of our operations. The result: Lower cost and better products. "I favor a policy of freer exchange of information between researchmen of different companies," says Mr. Rich.

3. We must stop reducing the value of the dollar.

4. Personal income and corporation taxes, depreciation allowances, and capital gains taxes should be modified. It would provide greater incentives for investors and free the venture capital the country needs so badly.

5. Reverse the trend toward centralization of government.

6. Strengthen our moral defenses.

Self-fluxing Sinter

The daily iron production of a blast furnace was increased from 653 tons to 1073 tons—a 64 per cent gain—by replacing natural iron ore with sinter, reports J. S. McMahan, superintendent, blast furnaces, Steel Co. of Canada Ltd., Hamilton, Ont.

He explains that self-fluxing sinter is made up of caked iron-bearing materials containing either dolomite fines or a mixture of calcite and dolomite fines. The amount of limestone or other flux required in the furnace is reduced and coke consumption is lowered.

General Steel Strikes Since World War II

Year	Duration	Length (Calendar Days)	Lost Production (Net Tons)	Estimated Wage Loss (Millions)	Estimated* Strike Cost (Millions)
1946	Jan. 21-Feb. 17	28	7,789,000	$120	$ 225
1949	Oct. 1-Nov. 11	42	9,169,500	180	402
1952	Apr. 29-May 2 June 2-July 26	3 55	17,900,200	300	480
1955	July 1	0.5 hr.	not estimated		8
1956	July 1-Aug. 3	34	10,975,300	250	285
Totals		162.5	45,834,000	$850	$1,400

Source: American Iron & Steel Institute.
*Direct loss to companies in sales revenue, maintenance.

Steel Negotiators Far Apart in Pact Talks, with 30 Days to Go

Steel contract talks, still on dead center as the deadline draws nearer, have a familiar ring. Here's how past parleys have been settled

IN 30 DAYS, steel industry bargainers and the United Steelworkers will reach the deadline which may signal the start of the sixth general walkout staged since World War II. In settling the 1956 strike, steelmakers traded 10 million ingot tons of production for three years without general strikes.

The highly publicized head of steam built up by industry's determination to hold the employment cost line and labor's demands for higher wages, benefits, and full employment would indicate a bitter deadlock by June 30.

• **Since World War II, five strikes have cost the industry $1.4 billion in lost production.**

The toll in ingot tonnage lost, damage to equipment, shutting down and starting up costs, is easy to figure. Not so easily measured are the inflationary costs which have accompanied the wage raises and which have driven up the price of both industrial and consumer goods (STEEL, May 4, p. 37).

• **Labor has had to work for years at inflated wages to recover the $850 million in wages lost during strikes.**

The hard, cold facts of inflationary wage boosts have been brought home to the rank and file. Says one: "I lost $600 in the last strike. It takes about three years to get back even." Another says: "You never make up the money you lose."

Losses on both sides were particularly heavy in the 28 day strike of 1946. Roughly 8 million tons of steel ingots were lost to the year's production before the effects wore off. The steel tonnage represented $225 million in direct losses, which with byproducts meant uncounted production losses by the mills. Something over $120 million in wages were lost by the strikers, an average of more than $260 per worker. Since they had been offered a 15 cent increase before the strike, their 18.5 cent settlement brought them only 3.5 cents more, or about three years' work at the higher wage to make up the loss.

• **Negotiations in 1947 avoided major union demands and gave industry two peaceful years.**

Big Steel and the steelworkers

reached agreement on Apr. 20, ten days before the extended contract deadline, which gave important new differential increases over the job range from 12.5 cents at the bottom to 27 cents at the top. The companies also agreed to study setting up a life and medical insurance program, but managed to sidestep such union demands as the union shop, portal to portal pay, and a guaranteed annual wage.

• Industry's anti-inflation drive did not hold down wages and prices in 1948, a year when labor could not strike.

Holding the line on wage talks which came up in the middle of a two year contract signed in 1947, U. S. Steel Corp. denied requests for wage boosts and, on May 1, cut prices on many lines of finished and semifinished products to combat inflation. The price reductions, totaling $25 million a year, were calculated to be those most directly bearing on the cost of living.

But wage-price stability was not to last. Wage concessions began to appear by midyear; General Motors Corp. granted an 11 cent adjustment and an agreement hitching future wage rates to the cost of living index. This opened the dikes and the anti-inflation program was washed out as other companies gave increases and either canceled their price reductions or announced new increases. Auto prices went up as much as $200; Aluminum Co. of America raised pig and ingot prices a cent a pound, the first basic aluminum increase in 11 years. Following the price rise were coal and coke, refractory brick, brass mill products, electrical products, and freight rates. Finally, steel abandoned its program: By late July, virtually all leading steelmakers effected wage increases ranging from 9.5 to 25 cents an hour over the spread of job classifications and price increases averaging over $9 per ton.

• A pension plan highlighted the 1949 settlement.

Bethlehem Steel Co. was first to sign an insurance-pension pact that ended a general walkout.

• Presidential interference in the strike of 1952, was outlawed by the Supreme Court.

A strike scheduled for Jan. 1 was postponed by Philip Murray, CIO Steelworkers' president, after he had been assured by President Harry Truman that the government would not invoke Taft-Hartley Act injunction procedures. Later strike deadlines were moved back as labor and industry leaders carried the dispute to Wage Stabilization Board hearings in Washington. When negotiations broke down completely, the delayed strike was called for Apr. 9; the President ordered federal seizure of the mills on Apr. 8. After being refused a temporary injunction against the seizure, the companies appealed to the Federal District Court in Washington, where the seizure was reversed by order of Judge David A. Pine. The government appealed to the Supreme Court, which affirmed Judge Pine's ruling on June 2.

Final agreement sent the steelworkers back to work on July 26, after they had lost $300 million in wages, and 15.3 million tons of ingot production had been lost.

Steel negotiators today are hoping against a repeat of the crippling 58 day strike of 1952; a walkout which, in the opinion of Defense Secretary Robert A. Lovett, damaged defense production more than an enemy bombing attack could have.

CORRECTION

The wage contract between Northwestern Steel & Wire Co., Sterling, Ill., and the United Steelworkers expires June 30. STEEL *(May 25, p. 89) inadvertently included the company in the list of steelmakers expected to continue operations in the event of a general steel strike.*

Steel Employment Costs, 1946-58

Year	Pay for hours worked		Other Payroll Costs†	Insurance Pensions SUB Social Sec.	Total Employment Costs
	Regular	Other*			
1958	$2.787	$0.144	$0.250	$0.332	$3.513
1957	2.582	0.147	0.188	0.299	3.216
1956	2.407	0.135	0.158	0.254	2.954
1955	2.246	0.130	0.133	0.213	2.722
1954	2.107	0.083	0.143	0.179	2.512
1953	2.023	0.122	0.122	0.173	2.440
1952	1.924	0.120	0.104	0.167	2.315
1951	1.769	0.103	0.073	0.169	2.114
1950	1.603	0.078	0.065	0.162	1.908
1949	1.574	0.059	0.070	0.050	1.753
1948	1.502	0.071	0.056	0.050	1.679
1947	1.393	0.063	0.057	0.050	1.563
1946	1.228	0.051	0.075	0.050	1.404

*Includes shift differentials, Sunday, overtime, and holiday work premiums.
†Includes vacation, adjustment, and nonworking holiday pay.
Source: American Iron & Steel Institute.

Metals' Share of Housing Market*

(Net tons)

Annual Housing Starts	Aluminum	Copper	Steel
1,000,000	50,000	126,700	2,000,000
1,100,000	55,000	139,425	2,200,000
1,200,000	60,000	152,100	2,400,000
1,300,000	65,000	164,775	2,600,000
1,400,000	70,000	177,450	2,800,000

*Tonnage figures do not include free-standing appliances.
All estimates by STEEL.

More Metal Going into More Houses

METALWORKING'S SALES to the home-building industry this year will be the best in history. And industry officials are convinced the market will expand rapidly in the immediate future.

Two trends fortify that belief. The most obvious is the increase in new housing starts, which has carried the 1959 cumulative total through April to a record high annual rate of 1,366,000 units. The second reason—and the most important over the long pull to metalworkers—is that more metalworking products are going into homes than ever before.

• Assuming that sufficient FHA financing will be available, the most popular forecast for 1959 housing starts is 1.3 million units or better.

Even without new FHA money, Washington observers feel that not more than 100,000 starts would be lost. If money is made available through FHA and if the GI loan interest rate is boosted to 5.25 per cent, the second half of 1959 could be even better than the first half.

Over the next few years, the outlook should improve. Housing officials feel that demand can support a 1.4 million unit market through the early 1960s. By 1965, new starts should be close to 1.6 million annually. Even if metalworkers merely hold their current share of the market, they will enjoy significantly higher sales.

• Many observers feel this is the breakthrough year for metal as a basic home-building material.

They look on the figures in the table above as a minimum of their potential in the new home market. Much of the gains will be in structural uses.

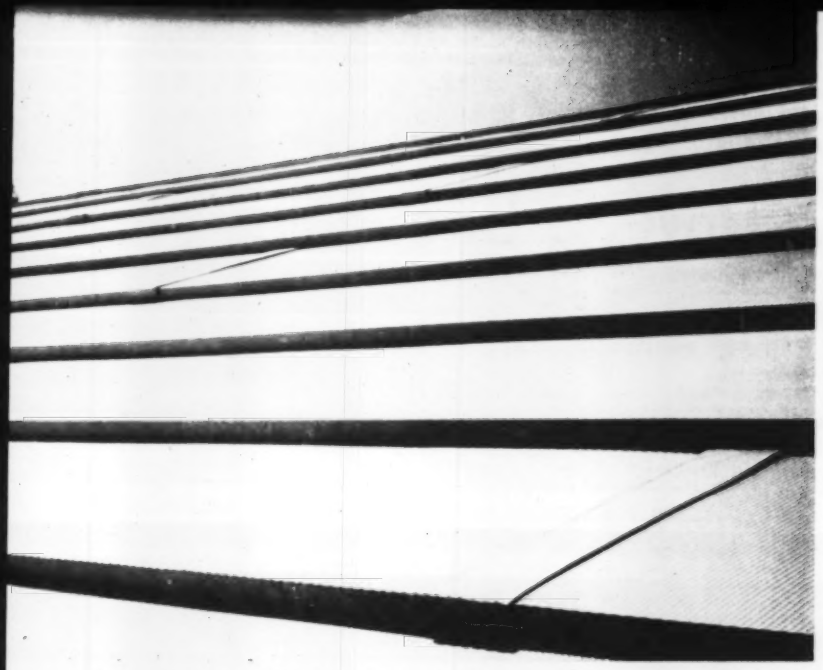
"Most builders are slow to accept changes," says one metalworking official. "But with the soaring costs of materials, labor, and maintenance, they are taking a fresh look at the cost-saving benefits of metals." Producers of both steel and aluminum are intensifying their campaigns for all-metal homes and greater use of their products in conventional homes to take advantage of the change of attitude.

• Market research men in the steel industry think that as much as 2 tons of steel are used in the average-size American home, mostly in sheets, strip, wire, and nails. Use of light structurals is also increasing.

Based on estimates of the Committee on Galvanized Steel Sheet Research, about 850,000 tons of galvanized sheets will be consumed if new starts reach 1.4 million units this year.

Of the several steel homes marketed in the last few years, about the only one still being sold is made by U. S. Steel Corp. It utilizes a basic 4 x 8 ft panel of conventional materials framed by specially channeled steel members. The roof trusses are of light structurals, and steel products are used liberally throughout. Average use of steel in these homes is 3.5 tons. U. S. Steel Homes expects to market from 1800 to 2000 of them this year.

Ferro Corp., Cleveland, is making another effort to market a porcelain enamel home this year. An experimental model, using 9 to 10 tons of steel, will be built in October. Co-operating with Ferro in the venture are U. S. Steel, Fenestra Inc., and Alliance Ware Inc. It will sell for $15,000 without lot.



A workman applies the ridge cap to an aluminum roof on Kaiser Aluminum & Chemical Corp.'s Woodlark home. This and other all-aluminum homes make maximum use of the metal in siding, roofing, soffits, windows, and other components

But the main effort of the industry is to encourage the use of steel where builders have troubles with other materials. One steelman tells of a builder who estimates it costs him $10 a call-back for customers who complain about warpage in wood doors. "He is willing to pay a $30 premium for a steel door that won't give him trouble or hurt his reputation," he relates.

• The aluminum people will gain the most from this trend to metal in structural applications.

Most industry officials say the average was about 50 lb a home in 1958, but they feel that the figure will rise to 100 lb in 1959 as the Big Three aluminum producers swing into high gear with their all-aluminum home promotions. (The market research department of one producer says its studies indicate the average is well over that figure now.)

Kaiser Aluminum & Chemical Corp. claims the use of 1700 lb of aluminum in its Woodlark home, introduced May 18. Reynolds Metals Co.'s House of Ease offers a package of 20 to 30 aluminum items with a claimed savings of $6000 in maintenance over a 30 year period. Aluminum Co. of America uses more than 9000 lb of aluminum in its Care Free house, first built in 1957.

The biggest splash in aluminum has been made by National Homes Corp., Lafayette, Ind., the No. 1 builder of prefabricated homes. In co-operation with Alcoa, it developed the Viking—"the first home designed from the ground up specifically for aluminum," say National officials. Its three models contain from 1400 to 3000 lb of the light metal, including sheathing, roof, doors, windows, and hardware. National claims that it will build 30,000 homes this year; over half will be the aluminum line.

With such efforts, Kaiser spokesmen think that by 1965, use of aluminum for all new housing starts will average 300 lb a house.

• While copper is not readily adaptable for structural use, the industry is pushing its products for greater use in other ways.

The Copper & Brass Research Association estimates that when copper is used, these quantities go into the average home: 35 lb for water service lines; 100 lb for distribution lines; 110 lb for wiring; 350 lb for copper tube heating; 500 lb for flashing, leaders, and gutters.

One of the most promising new uses for copper is in waste drainage, says CABRA. In co-operation with the University of Illinois, it developed copper drainage tubing (DVW) and has succeeded in gaining code approvals in more than 165 cities since 1955. The average application involves about 185 lb of the red metal.

Copper producers feel that several of those uses have definite growth characteristics. For instance, only about 40 per cent of all homes now have copper water distribution lines, but that percentage is increasing. Only about 10 per cent have copper tube heating, but CABRA feels it "may increase substantially if the advantages of copper can be brought home to the builders."

• Several trends in home design are having a favorable influence on sales of home furnishings and equipment.

Prominent among them is the big swing to built-in kitchens. One estimate is that about 30 per cent of new homes come with at least a built-in range. Other popular options include incinerators, waste disposers, and dishwashers. Less popular, but gaining strength, are laundry equipment and refrigerators. One industry official says that an indirect effect of new housing is that a fairly large percentage of new home owners buy new appliances rather than move old ones.

Another beneficial trend is toward the two bathroom home. The Plumbing Fixtures Manufacturers Association is developing a privazone sales campaign which it figures could double the use of plumbing fixtures in the home. Last year, the plumbing fixtures industry made shipments (for all types of construction and maintenance) worth $306 million.

Makers of steel kitchen cabinets are counting on a comeback in 1959 after watching their markets shrink for three consecutive years. The shift to more metal in the home is almost sure to benefit them as well as all other metalworkers who serve this industry.

• An extra copy of this article is available until supply is exhausted. Write Editorial Service STEEL, *Penton Bldg., Cleveland 13, Ohio.*

States Step Up Drive to Lure Industry

State governments are fishing with:

- Advertising in national media.
- Expanded publicity programs.
- Personal calls on executives.
- Booths at trade shows, conventions.

They hope you'll take these baits:

- Plant location aid.
- Engineering services.
- Financing assistance.
- Help with special problems.
- Special studies on request.
- Regional population counts.
- Available manpower data.
- Programs to select and train labor force.
- Initial tax benefits.
- Temporary working capital.
- Power, fuel, and water availability data.
- Comparative transportation studies.
- Location of existing plants up for sale.
- Survey of competition and consumers.

All 50 states will try more and more to convince you theirs is the best of all possible worlds. Here's a capsule rundown on what the states are offering, what you should look for, and how to determine where to locate that new plant

YOU'RE the prize catch in a fishing contest that has our 50 states energetically casting for new industry.

The postwar shuffle in America has meant the large scale relocation of industrial plants. Our spiraling economy, diversification, and the rapid swing into new products and processes have spurred the mass search for new plant locations.

• **You're Popular** — State governments haven't been blind to the trend. Even the extreme left-winged politico would like nothing better than to have you build in his bailiwick. Here's why: New industry means jobs. Jobs mean money. Money means taxes. Taxes (both individual and corporate) mean economic solvency and state growth.

Clifford F. Hood, retired president, U. S. Steel Corp. reports that 100 new production workers in a community can increase personal income by more than $500,000 annually. They create additional employment for about 175 other people. They make possible four more retail establishments and introduce about $360,000 worth of retail sales a year.

• **You're Involved** — As a metalworking manager, odds are that you'll participate in a decision on where to build a new plant or relocate one.

It's not easy to pick the best site. Every state tells a good story. Listed above are some ways the states will help you. But not every one offers all those benefits. For example, only a few give tax breaks. Some don't aid with financing or have the machinery to provide temporary working capital. Others will provide virtually any service you need.

Some states, notably Maryland and California, are just getting started on formal programs. Others, like North Carolina (it's had a full-time development and promotion program since the midthirties), are veterans at wooing industry.

• **What They Offer**—To find out what help you can get, contact the state of your choice. Most have special departments for industrial promotion and assistance. Examples of what states will do:

• Maine will lend up to 90 per cent of the cost of an industrial property

under a state insured first mortgage. The state has no personal or corporate income tax.

• Rhode Island offers 100 per cent financing of new industrial plants.

• Alabama offers new industries ad valorem tax exemptions of up to ten years on all property except land.

• Indiana's only two taxes on industry: An income tax of 0.475 per cent on gross receipts from wholesale sales of goods not in interstate commerce and 1.5 per cent on all other receipts derived in Indiana.

• Mississippi grants certain tax exemptions for five to ten years on the building, grounds, and all equipment.

• Arkansas has a nonprofit finance development corporation that will grant tax preferred loans.

• **Most Active** — Most southern states and a few in the Midwest are most active in promoting their areas these days—and they're leading the race in industrial growth. Here are the states with the highest per capita expenditures for industrial construction. (Period: 1956-58): Indiana, $211; West Virginia, $127; Alabama, $124; Texas, $120; Arkansas, $109; Ohio, $107; Louisiana, $81.

Tiny West Virginia, sparked by the traveling salesmanship of Gov. Cecil Underwood, has claimed 143 new plants with a capital investment of over $1.4 billion since 1954. Florida's postwar industrial growth has been little short of fantastic. New Jersey has done a good job. Gov. Robert B. Meyner told STEEL his state now boasts more than 10 per cent of the nation's research employment. North Carolina has one of the best records of steady growth. Tennessee has been particularly attractive to metalworking—it now boasts the largest concentration of tool and die shops in the South. During the last two years, Idaho has enjoyed the greatest industrial expansion in the state's history.

• **In Trouble** — Some traditionally big industrial states aren't doing too well. Example: Michigan (STEEL, May 25, p. 104). The state is broke. Already burdensome tax rates will probably go even higher. Massachusetts has an excessively high debt, climbing taxes, and spi-

He Sells a State to Industry

WHEN Connecticut's Abraham Ribicoff eked out a victory (by 3115 votes) in the 1954 gubernatorial race, his state was afflicted with a malady that plagued most of industrial New England. Industry, faced with spiraling taxes, free spending legislatures, and hostile state officials, was moving elsewhere.

Today, Connecticut is a fiscally stable Gibraltar surrounded by a sea of states with monetary problems. The budget is balanced without the benefit of increased taxes. Governor Ribicoff has pledged no tax hikes in 1959-61. He also told STEEL: "There will be no personal income tax while I'm in office."

Democrat Ribicoff's philosophy is this: "A state has to be well managed like a corporation or the stockholders (the citizens) suffer. To allow state spending to run ahead of foreseeable revenue is fiscal irresponsibility."

Because of that attitude, voters elected him to a second term last year by a plurality of 246,000 votes—the largest ever garnered by a Connecticut official. Even plush, Republican-oriented Fairfield County, populated by New York commuters, climbed on the Ribicoff bandwagon.

Early in his administration, the governor saw that the state would need more money to maintain and increase its high level of services (first in welfare, second in mental health). "The only way a state can continue a high brand of services without hurting taxpayers is to stimulate industrial growth, which means more jobs and more tax revenues. Encouraging industrial expansion is one of the most important jobs a governor has."

For Governor Ribicoff, the attraction of industry has two basic steps.

First, to maintain a good industrial climate through: Eliminating waste and duplication in the state government, keeping taxes stable (Connecticut's corporation taxes have remained static over the last few years and plans are for them to remain so), and having state employees genuinely interested in promoting industrial growth.

Second, to sell the state to industry and to work with management to make the transition as painless as possible. Articulate and energetic, Ribicoff, a youngish 49, makes this his personal responsibility. He makes frequent calls on firms seeking plant sites. "I'm willing to meet with any one, any place, any time," he told STEEL. "I'm also personally accessible at any time to any old or new business that wants to see me."

He's known as a red tape cutter. For example, when a large magazine printing firm, which has to operate seven days a week, moved into the state, it ran into Connecticut's Sunday blue laws. The problem was taken to Ribicoff. Within hours, he called legislative leaders in both houses together and had an amendment pushed through to allow the firm to operate.

When talking with industrialists, the governor plugs Connecticut's "strategic location" and large pool of skilled labor. He also pushes "gracious living" and recreational opportunities. He doesn't believe in pirating industry away from another area. His No. 1 target: Midwest and west coast firms that would like to trek East for branch plants.

Ribicoff's formula of a fiscally stable state aggressively seeking new business has paid off. Since he took office five years ago, 650 new manufacturing plants (employing 17,000) have opened in Connecticut.

raling social welfare costs, that keep the state living beyond its means. New York's growth has lagged behind the rest of the country in recent years. Gov. Nelson Rockefeller has promised "vigorous action" to halt this trend. Taxes keep rising as efforts are made to balance the budget but little is done to trim the fat from government operations.

What to Check in the Areas of Your Choice

ECONOMIC:

- Accessibility to markets.
- Labor supply.
- Wages and salaries.
- Transportation costs.
- Raw material availability, cost.
- Availability of building sites.
- Insurance rates and laws.
- Banking and credit facilities.
- Site characteristics.
- Utilities, fuels and services.

POLITICAL:

- Labor's attitude.
- Labor laws.
- Taxes and tax plans, tax trends on business in relation to other taxes.
- State and community debt trend.
- Workmen's compensation laws.
- Laws governing disability benefits.
- State and local government attitudes.
- State and local subsidies.

SOCIAL:

- Cost of living.
- Health, education, welfare facilities.
- Housing.
- Climate and recreation.
- Industrial neighbors.
- Area's economic condition.
- Community attitude.
- Other business attitudes.

Source: Profit Counselors Inc.
Trundle Consultants Inc.
Walter Kidde Constructors Inc.

• **Dollars** — States are increasing their industrial development budgets. STEEL surveyed all 50 and found expenditures range from a low of $17,000 to over $1 million.

Besides the states themselves, you can get information on an area from other sources. P. T. Waldbillig, vice president of Profit Counselors Inc., New York, suggests these: Railroads, utilities, local chambers of commerce, real estate firms, builders.

• **Where to Locate**—Once you've nailed down the area where you would like to locate, your final decision will depend on what factors are most important to your operation. The checklist on this page gives general items of most importance. Mr. Waldbillig suggests you set up a scan chart this way: List the elements in the order of their effect on the cost of your product. If you have 20 items, the most important factor is given the weighted value of 20, the next 19, and so on. Do this with each area you have selected as a possible building site. The one with the highest number of points should be your best bet.

Sometimes, special considerations will dictate a plant site. Federal Pacific Electric Co., Newark, N. J., picks a plant site by determining the geographical center of a market for the class of products it intends to manufacture (the theoretical spot where freight rates are at the optimal minimum). The competitive situation is also a prime factor. For instance, FPEC recently opened a panelboard-switchboard plant in the Southeast because market studies showed the area is a net importer of such equipment.

When Kaiser Aluminum & Chemical Corp. decided to build an eastern reduction plant and rolling mill, it wanted: 1. To be near 70 per cent of the potential market. 2. To cut the distance of raw material flow. 3. To have inexpensive power from a fuel with large reserves. 4. To have low cost bulk transportation. 5. To tap a surplus labor market. Its choice: Ravenswood, W. Va.

If you have a laboratory employing many highly skilled scientists and engineers, you should pick a spot near the right types of residential, shopping, social, cultural, and recreational areas, warns M. H. Cutler, Stone & Webster Engineering Corp., New York.

• **Watch Out** — The pitfalls are numerous. Robert C. Trundle, president of Trundle Consultants Inc., Cleveland, lists these three:

• **Distance is sometimes a false criterion.**

There's a tendency to stress the importance of being close to raw material supplies. Instead of insisting on that, metalworking companies should look at their over-all material assembly costs, then relate them to all other variable cost factors.

• **Don't ignore gaps in transportation services.**

One brass manufacturer found he had built his new plant outside the free pickup and delivery zone of a large midwestern city. The oversight costs the company almost $50,000 a year.

• **Don't base your decision on hourly wage rates alone.**

Within the framework of labor costs, consider overtime, piecework incentives, cost of living adjustments.

• **Third Choice**—If you're trying to decide between expanding your facilities or building a plant, don't overlook a third alternative—buying a plant or company. That's the suggestion of Robert J. Kennedy, partner, Hammond, Kennedy & Legg Co., New York.

Mr. Kennedy names these advantages:

1. A company can move more quickly by buying plant facilities.
2. The finance problem is often overcome.
3. When a company buys a plant, it can often buy an organization to go with it.

• An extra copy of this article and one which appeared May 25 (on Michigan's financial plight) will be available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.

Distributors get a close look at the product and how it's made during Parker-Kalon's sales course

How to Teach Distributors to Sell

YOUR DISTRIBUTORS CAN do a good job of technical selling. All they need is an opportunity to learn more about your products.

That's what a major producer of fasteners has found. Parker-Kalon Div., General American Transportation Corp., Clifton, N. J., sells exclusively through distributors. But the firm no longer worries about losing sales and alienating customers due to lack of knowledge about the products.

Reason: P-K brings its distributor salesmen to the plant for a week-long course on how fasteners are made and how to select the right one for a job.

The company has proved that it's not too difficult to make technical salesmen out of distributors. You can probably do it and save the cost of the program many times through the better job distributors will do.

Take these tips from P-K's experience:

• **Make the Course Complete**—Give the men information they can use. Don't bombard them with company propaganda.

Bring them into the plant and take them through each step in the manufacturing process. Explain the why and how of procedures in terms of each machine they see. Show them the value of testing and inspection. Use lectures and workshop sessions.

Have your factory specialists outline in detail the uses of each type product. Let the distributors suggest applications and discuss the right item for each. Define the nomenclature for specials and finishes.

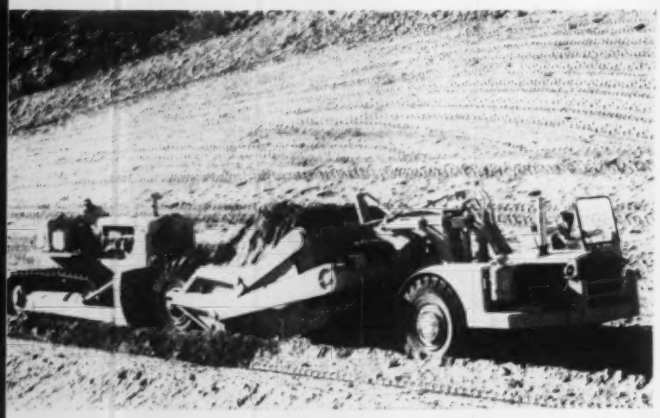
Interpret pricing, advertising, and sales promotion. It'll bring about a closer relationship between company and distributors. Answer all questions—from the most basic to the most technical. P-K assumes that the salesmen are serious about learning so they give the information with few frills.

• **Keep It Personal**—Men attending the sessions will range from people with 30 years' experience to young men just getting started. Your course will be more successful if you slant it to the newcomers.

Keep the classes small; P-K prefers 12 to 15 men. Encourage them to ask questions, to stop the discussion when any point is not clear.

Give them the feel of manufacturing. P-K puts shop coats on the students and lets them get their hands dirty. They operate the machinery and testing equipment. They're shown how and why each job is done.

• **Keep It Serious**—Don't let the students think the course is a vacation. Give them plenty of work. Night sessions will help, especially if your plant is near a city.



Highway Program Looks Safe

UNLESS President Eisenhower vetoes the new highway bill, metalworking managers concerned about the progress of the federal program can breathe easier now that the House Public Works Committee has O.K.'d H.R. 5950, introduced by Rep. George Fallon (D., Md.). It means that the program will continue to take 3.8 million to 4 million tons of steel products each year.

As amended by the committee, the bill parallels S. 1826 introduced by Sen. Jennings Randolph (D., W. Va.). Both houses of Congress appear ready to accept the suspension of the Byrd pay-as-you-go principle, which was attached to the original act.

If the Byrd amendment had not been sidelined, the Commerce Department would have had no authority to apportion funds to the states for federal highway construction in fiscal 1961 and would have had to limit apportionment to $500 million for fiscal 1962. The funds must be set aside this year and next to provide the states with the necessary leadtime to keep their programs moving smoothly.

Ike Will Hesitate to Use Veto

Two weeks ago, the President told Congress the only way to keep this mammoth program on schedule was to increase revenues for the trust fund via higher gasoline taxes. He said attempts to move other taxes into the trust fund were inadequate because Uncle Sam would still end up short. Some observers have concluded Ike was hinting that he would use the veto—if Congress didn't act as he wanted.

But Ike will certainly hesitate to use the veto power, just as he will resist using it on the new housing bill, even though that bill contains millions of dollars for public housing and urban renewal he doesn't want. To veto either bill is to risk the future of the Republican party in the 1960 elections. Housing and highways are tremendous forces for economic growth and employment, and the recent recession is much too fresh in the minds of the Republicans.

Saltonstall Bill Looks Dead

Revision of the Pentagon's buying practices, via Sen. Leverett Saltonstall's (R., Mass.) bill (S. 500), is becalmed, report small business sources on Capitol Hill. They are fighting the bill primarily because of its emphasis on negotiated military contracts as a means of speeding up weapon developing. Even if the bill gets out of committee, these sources agree that a floor fight would go in favor of the small business enthusiasts.

Robert Weadock, Beloit Iron Works's Washington representative and a member of the Pentagon's Small Business Advisory Committee, also takes issue with Senator Saltonstall's plan to substitute "performance" specifications for detailed specs in writing contracts. (Such gross examples of tomfoolery as 18 pages of specs for a ping-pong ball would be eliminated.) By working on performance specs, says the senator, business would gain the opportunity to be more creative in carrying out the Pentagon's wishes. But Mr. Weadock believes: Such a change would "merely make further inroads into the competitive field by reducing the information available for intelligent procurement."

Who Owns the Knowhow?

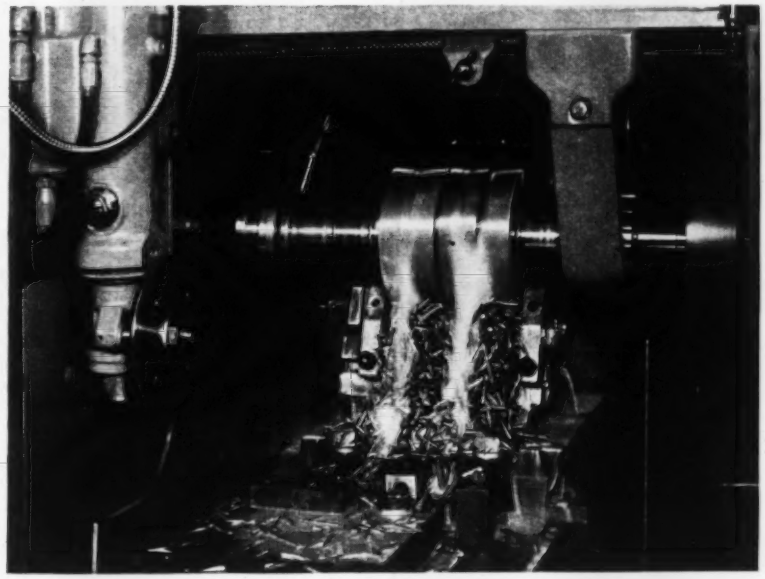
A panel on subcontracting at the national missile industry conference last week came close to defining the relationship of small and medium sized firms with prime defense contractors. "The day of sharing the wealth (of defense contracts) is long past," warned Maj. Gen. Albert Boyd, vice president of Westinghouse. Added Rear Adm. Charles Horne, vice president, Convair: Electronic firms can no longer expect a fair share of business "just because they are in electronics." With those warnings in the air, Bruce Brace, Raytheon's general purchasing agent, and William Ballhaus, Northrop vice president, suggested: "In their enthusiasm" to land a contract, subs give the prime more of their knowhow than can be protected legally as proprietary information. The best advice for subs to follow: Find out how much information the Pentagon requires the prime to obtain before handling out knowhow gratis.

How Much Creativity Do They Need?

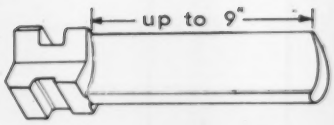
Another aspect of prime-sub relations. Should the sub use his wits to provide a better product, or adhere strictly to specifications given him by the prime? Mr. Ballhaus reported too much creativity can be a dangerous thing. In one case a sub changed a small clip from beryllium copper to phosphorous bronze to speed up production. The phosphorous bronze clip met the specs, yet failed in the qualification tests applied to the complete missile assembly. The needed quality of elasticity was missing when the missile had to withstand a certain load. The sub had no way of knowing what load would be applied.

Cincinnati TRACER CONTROLLED HyPowermatic

- - - mills airfoil section of turbine blades in two operations



Tracer control mechanism (left in the illustration), built-in automatic backlash eliminator, and automatic deflection compensator for the overarm are prominent feature-advantages in this HyPowermatic setup . . . down-milling the airfoil section of turbine blades; up to 9" length of blade in one cut.

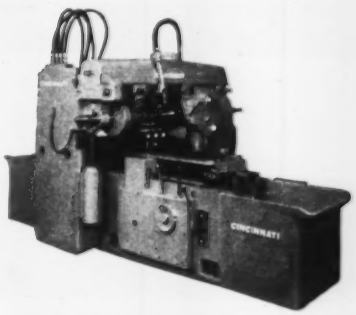


Airfoil sections of steam turbine blades are not the easiest shapes to machine. They present two unusual problems: 1) the turbine blade contour must be accurately reproduced, and 2) length and structural strength of the section impose unique requirements on the machine performing the operation. Both problems disappear when the work is assigned to a CINCINNATI Tracer Controlled HyPowermatic Milling Machine.

Contour and entire length of the airfoil section are milled in only two operations

HyPowermatics offer many advantages for heavy duty work. These fine milling machines are powerfully constructed to remove metal rapidly and smoothly. The tracer control mechanism operates from inexpensive templates attached to the machine table or work fixture. It will accurately trace curves and straight lines up to 80° from the horizontal. HyPowermatics are equipped with an automatic backlash eliminating device which extends the range of work assignments to include down-milling. The Dynapoise overarm, another of the many exclusive features, incorporates an automatic hydraulic deflection compensator.

Other feature-advantages include automatic spindle stop; automatic two-way table cycles; four-position directional table control lever; hydraulic engagement of spindle drive clutch, and many more. May we give you complete information?



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POSITIVE DELIVERIES

Finkl vacuum degassed steel promotes high density centers in large die blocks, therefore reducing the possibility of a late shipment because of ultrasonic rejection.

Finkl was first with die blocks fully water quenched. Finkl was first with deep hardening nickel-chrome-moly die blocks, the forerunner of the AISI 4300 Series. And now, we are pleased to add vacuum degassed steel die blocks and hot work die steels to our line of products—another Finkl First. They represent our policy of offering our customers every advantage to reduce costs and increase production.

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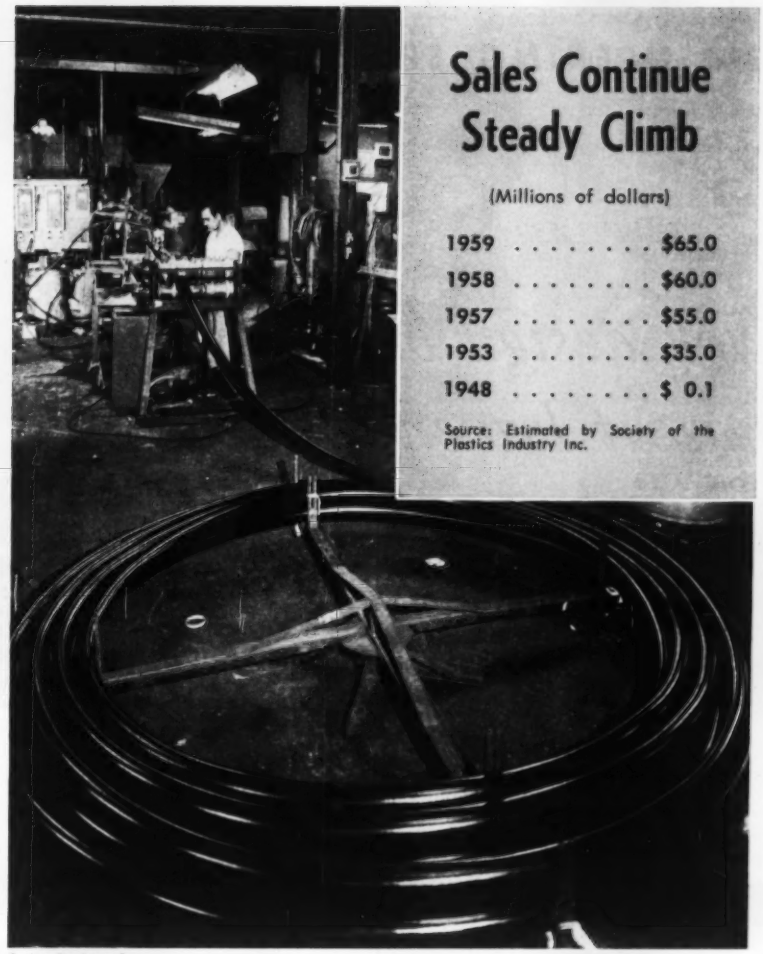

Sales Continue Steady Climb

(Millions of dollars)

1959	$65.0
1958	$60.0
1957	$55.0
1953	$35.0
1948	$ 0.1

Source: Estimated by Society of the Plastics Industry Inc.

Carlon Products Corp.

Plastic Pipe Boom Bumpy

THE PLASTIC PIPE industry is racking up record sales again this year. But the young industry is grappling with growing pains—price fighting, quality problems, and consumer education to name a few.

Sales will reach $65 million this year, estimates the Society for the Plastics Industry Inc., New York. SPI anticipates production will hit 58.3 million lb (1958: 56 million lb). Market breakdown: Polyethylene, 75 per cent; PVC (polyvinyl chloride) and ABS (acrylonitrile butadiene styrene), 10 per cent each; miscellaneous, 5 per cent.

• **Prices**—"Competitors are increasing faster than the market," says one company. Over 100 firms make plastic pipe. There were six in 1948. Many firms are crashing the crowded market by cutting the distributor's price. A firm reports: "Our price for ½ in. pipe is $3.76 per 100 ft, but we'll drop to $3.17 to meet competition. Some competitors sell as low as $2.50."

Resin suppliers have been accused of discounting. High pressure polyethylene (long accepted by the trade) has been challenged by linear (high strength) polyethylene producers. Having too much capacity, the high pressure people are said to be dumping some material on the pipe market.

When demand catches capacity (which will be a while), pricing should settle. Until then, price fighting is expected to continue.

• **Quality**—Quality problems have occurred where low grade materials are used to meet price competition. They appear to be more prevalent in polyethylene pipe. Recently, linear polyethylene and Type II ABS have been introduced. They give higher temperature resistance and greater tensile strength than previously available. But these advantages are sometimes negated by producers who make thinner walled pipe for the price wars.

Uniform standards are needed, states Yardley Plastics Co., Columbus, Ohio. Quality and performance standards are being established through SPI and other groups.

• **Education**—Goodall Rubber Co., Trenton, N. J., feels the public needs more information.

"Consumers must be aware of the various types of plastic pipe and their applications," comments Resistoflex Corp., Roseland, N. J.

"Plastic pipe needs full acceptance by building codes," emphasizes B. F. Goodrich Industrial Products Co., Marietta, Ohio. Codes are changing, but it's an unceasing battle.

"One of our biggest expenses is research," comments Colonial Plastics Mfg. Co., Cleveland. "Without it, a new plastic might come along and we'd be selling an obsolete product." And each new plastic must have code approval.

• **Imports**—Imported pipe (of good quality), primarily from Japan, is a problem in some areas. If foreign raw material costs substantially undercut ours, producers agree there will be tough competition.

• **Outlook**—Chemical, cold water, gas distribution, and electrical conduit applications show the rosiest future for plastic pipe. Long term field experience will help the industry's education and sales program, adds Busada Mfg. Co., Flushing, N. Y.

A new plastic, polypropylene, is said to be suitable for applications where heat resistance is necessary, previously an industry stumbling block. It is being tested by Carlon Products Corp., Aurora, Ohio.

HOW THE ENGINEERING SERVICES OF

Central Foundry

help you design better castings at lower cost

Many new developments here at Central Foundry have broadened the field of application for castings and have given design engineers greater latitude. To assist you in exploiting these new methods and materials to fullest advantage, each of our engineering departments—design, experimental, process and metallurgy—is at your disposal. Central Foundry is also using a number of testing techniques such as stress analysis, cobalt radiography and sonic testing, that have proven invaluable in lowering the cost and improving the quality of castings. These procedures help us to determine the best design and method of producing a casting, either by the green sand method or the shell mold process, and the best material for the casting, either grey iron, malleable iron or ArmaSteel.

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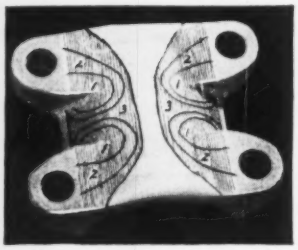
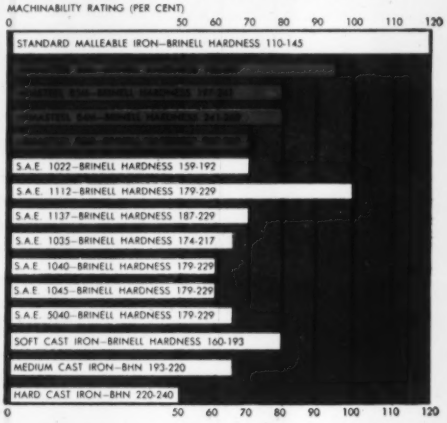
An important part of our engineering services is the stress analysis laboratory. Stress analysis discovers the amount of stress on a part due to its service function and is an important aid in determining and improving the strength of a part. Improved casting design can be accomplished through the use of stress-analysis by more effectively distributing the metal in the part. The U-bolt anchor plate shown here is a case in point. Our customer was experiencing failures in this part and asked us to see what we could do to solve the problem. Using stress analysis the part was completely redesigned for maximum efficiency. The redesigned part is 35% stronger, 42% lighter and less costly.



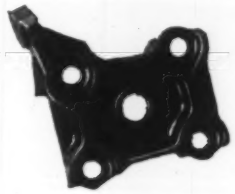
EXCELLENT MACHINABILITY FOR INCREASED PRODUCTION



CENTRAL FOUNDRY DIVISION

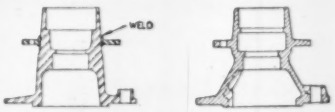
REDESIGN FOR STRENGTH

This is a rear spring clip pad that was converted to a casting with the help of stress analysis. The clip pad supports the shock absorber arm and clamps the spring to the rear axle of an automobile. When produced as a stamping, this part weighed 4-1/4 pounds. However, when designed as an ArmaSteel casting, weight was reduced to 2-9/10 pounds. Most important, based on comparative stress analysis tests, the casting is *30% stronger* than the stamping. (In addition, the holes are produced by the foundry, making it unnecessary for the customer to punch them.) This conversion from a stamping to a casting resulted not only in increased strength, but in substantial cost savings, as well.



REDESIGN FOR IMPROVED PRODUCT AND ECONOMY

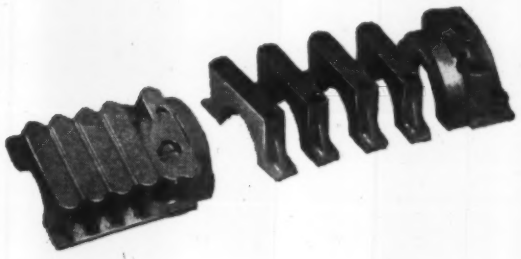
Many of our customers have found that redesigning a product to be made as an ArmaSteel casting rather than as a fabrication, forging or stamping, has resulted in a better part at less cost. The fabricated design of a rear wheel truck hub at the left consists of a forged base with a steel plate welded in place to form the smaller flange. The casting on the right, designed jointly by the customer and our engineers, is of single piece construction, is lighter, stronger and less costly than the fabricated design and eliminates the fitting and welding of the small flange.



FABRICATED DESIGN ARMASTEEL CASTING

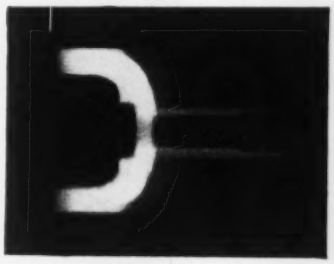
PROCESS ENGINEERING FOR LOWER COST

Our process engineers are continually looking for ways to more economically produce castings, thus lowering the finished-product cost. Shown here is a single casting that combines 5 bearing caps used on a V-8 engine. The casting is almost completely machined as a single piece, and the parts are then separated in a final operation. Substantial savings are realized in both casting and machining costs.



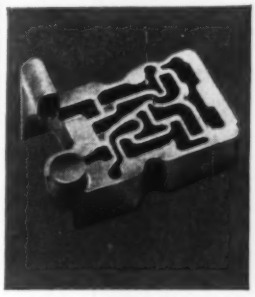
COBALT RADIOGRAPHY FOR ASSURED QUALITY

Radiography, by means of Cobalt 60, has drastically reduced the time required to check castings and is an important aid in obtaining the best possible casting quality. In an effort to eliminate a machining operation on the universal joint yoke shown here, a design change was made in the tube section of the part. When sample castings of the new design were checked radiographically, it was immediately apparent that the design was unsatisfactory since it caused acute metal feeding problems. By redesigning and further checking by radiography, Central Foundry was able to produce, in the shortest possible time, a lighter casting which required less machining in our customer's plant.



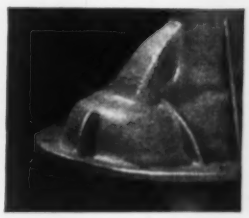
SHELL MOLDING FOR GREATER ACCURACY

Shell molding, a relatively new process of making castings, is now being employed extensively for fast, simple production of complicated castings, such as those requiring narrow, accurate passages and cross sections. It is practically impossible to produce certain parts in any other way without prohibitive costs; this is especially true of ferrous metals. Complicated parts like the manual control valve body shown here, a part of the automatic transmission of a military vehicle, are readily cast in grey iron when the shell process is utilized. The part had been considered as an aluminum die casting, but was thought unsatisfactory because of adverse expansion and wear characteristics. In this case, meeting the requirements for very close tolerances on the thickness and location of ports was made possible by the shell molding process.



REDESIGN FOR WEIGHT REDUCTION

Vehicle weight reduction is a matter of increasing importance to design engineers . . . and more and more existing parts are being converted from a low or medium to a high strength ferrous material such as ArmaSteel. On the left is a grey iron differential carrier currently used in an automobile. By taking advantage of the superior physical properties of ArmaSteel, it was possible to design the part on the right which is *five pounds lighter*. The modulus of elasticity of ArmaSteel is approximately 60% greater (the tensile strength about twice as great) than the grey iron material.



90

GENERAL MOTORS CORPORATION • SAGINAW, MICHIGAN • DEPT. 20

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Wherever it is used, Amchem Granodraw SS has proved its merits over competing products—in a finer, denser, more continuous coating of greater penetrating power to coat contact areas. The result is a trouble-free, service-free product with basic user advantages of greater speed of draw, greater total reductions, longer tool life, easier inspection, finer finishes and more effective lubrication!

If you work in stainless, you'll work faster, better and more economically with Amchem Granodraw SS!

NEW AMCHEM SERSEAL* AVAILABLE OVER GRANODRAW SS BATHS!

Newly developed Amchem Serseal provides an effective chemical blanket over coating baths to prevent escape of heat and fumes. In actual field use, *heat savings of up to 70% have been reported,* with substantial reductions in cost and time required for maintenance of heating elements and elimination of costly ventilating systems! Call your Amchem man or write for full details.

*Patent Applied for

Complete details about Amchem Granodraw processes are contained in Bulletin 1437. Write for your copy today.

AMCHEM **GRANODRAW SS**

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How GM Orbits Cost Cutting Ideas

OLDSMOBILE DIV., General Motors Corp., cut material costs 40 per cent by switching from spring clips to wire staples to attach rubber aprons to front end sheet metal parts—thanks to the Process Development Staff's production engineering section.

The unique group, under the direction of John Q. Holmes, is headquartered at GM's Technical Center, Warren, Mich. It acts as a clearing house and advisory agency for the exchange of ideas and technical information on plant and manufacturing problems. Exchanging cost cutting ideas and methods is relatively simple in small companies or in firms with more centralized management, but GM's decentralized structure makes it difficult.

Most of the ideas center on safety, quality, productivity, and cost reduction.

• **Activities**—To do its job, production engineering sponsors 13 committees covering activities ranging from material handling to metallurgy. It also publishes bulletins covering new methods, a monthly newsletter on cost cutting ideas, and special technical standards for corporate and industry use.

Mr. Holmes's staff also maintains GM's machinery records, listing all the 176,000 corporate owned items of tooling and equipment, plus some 20,000 pieces of government owned equipment in GM plants. The service helps divisions looking for special equipment or wanting to dispose of surplus tools (STEEL, Sept. 8, 1958, p. 112).

• **Committees**—With the exception of the machinery records, most of the information is developed through the committees. Besides coming up with solutions to production problems, the committees often recommend standards for equipment and methods that are adopted by the corporation. Says Mr. Holmes: "No division has to accept the standards, but they're available if they want them."

• **Establish Standards**—Most of the information is restricted to corporate use only, but some sets of standards on tools, equipment, materials, and processes are sold to suppliers, manufacturers in other industries, and to competitors. As a result, GM standards are used by other companies and sometimes are the basis of national standards.

Although GM prefers to use na-

You Can Win a Firebird III Model . . .

or a full color print of a dream car:

Enter STEEL's second "BEAT-THE-EXPERTS" contest. All you do is estimate U. S. passenger car production for 1959; fill out the coupon below and mail it to us. Contest rules and prizes are listed in STEEL's new Reader Service Department, Page 5 of this issue.

I believe _____ automobiles will be produced in the U. S. during the last six months of 1959.

Mail this to:

Ed Service
Beat-the-Experts
STEEL
Penton Bldg.
Cleveland 13,
Ohio

PRINT NAME _____
POSITION _____
COMPANY _____
ADDRESS _____
CITY _____
STATE _____

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John Q. Holmes heads GM's production engineering section

tional standards when possible, it sometimes finds it must do the job itself. In 1936, for example, the corporation formulated standards for abrasive discs and plate mounted wheels. When the American Standards Association developed similar national standards in 1957, GM dropped its system and adopted the ASA's.

• **Spot New Methods**—Committee reports and information are also circulated within the corporation to demonstrate new methods used by divisions. A recent bulletin from the chemistry committee discusses a die cleaning installation at GM's Ternstedt Div. It removes scale and solder from diecast dies without etching the base metal. A material handling bulletin shows how Frigidaire Div. has developed a simple setup for packing automatic washers. Another publication gives details on an inexpensive air plug gage developed by AC Spark Plug Div. It's used by Cadillac to check surface finish and inside diameters on a production part.

• **Gives Thrifty Tips**—Mr. Holmes's section also publishes a monthly newsletter, *Industrial Trends*, which is circulated among 3000 corporation members. A recent issue covers such new cost saving methods as bulk packing of automotive light bulbs, a plastic fabricated base plate for an exhaust pipe and muffler assembly fixture, and a flow divider for parts going from a stamping press to two identical, but slower, welding operations.

"Ideas like those can be adapted by other divisions. Members of the department are also available for special assignments covering industrial waste, plant ventilation, heat treating furnace design and use," adds Mr. Holmes.

Set Light Car Schedules

Advertised list price for Ford's two door Falcon sedan is reported to be $2047. The four door job will list for $2107, says one STEEL source. The small cars are scheduled for mid-October introduction, but station wagon styles won't be available until the first quarter of 1960.

The Falcon initially will be built at Lorain, Ohio, and in Canada, says Ford. While the company has not yet released specifications, STEEL has confirmed that the car will have a 109.5 in. wheelbase and will be 181.1 in. long. Width is 70 in. and height is 54.5 in. The six cylinder engine will be rated at 86.5 hp. The block has an integrally cast intake manifold to eliminate side covers which have caused leaks. Curb weight is 2350 lb. It will go from zero to 60 mph in 18 seconds. Floor pan and rocker panels are made of galvanized steel to resist corrosion.

Chrysler's small car, the Valiant, won't be available until late December, although the company plans to introduce it at least a month earlier. The corporation is shooting for 7000 units by Christmas. Chrysler has been more successful than Ford or Chevrolet in keeping details of its small car secret. Its styling will be similar to the other 1960 Chrysler models. Several sources still declare it closely resembles the Imperial in appearance—clean lined, with little chrome or ornamentation.

Valiant's wheelbase is 106 in.; over-all length, 183.8 in. It's 70.1 in. wide, 54.1 in. high, and has 7 in. ground clearance. The car will weigh 2600 lb. Initially, it will be powered with the revamped 170 cu in. displacement Plymouth engine. Chrysler still wants to use its aluminum engine, but it isn't likely to come before 1961.

Chevrolet is moving into prototype production of its light car. The division is projecting a minimum of 20,000 units monthly, starting in September. Chevy reportedly hopes to have 150,000 Corvairs by mid-February. Its tentative introduction date is Oct. 9. GM confirms that the Corvair will be part of the Chevrolet line. It will be built at Willow Run, Mich.; Oakland, Calif., Kansas City, Mo., and in Canada.

Other small car announcements keep turning up. Four Canadian businessmen say they plan to produce a light car with a European engine and a glass fiber body in 1960. It will sell for $1100 or $1400, says Leo Finnegan, president, Zar Auto of Canada, Windsor.

Olds Simplifies Air Ride

Oldsmobile Div., General Motors Corp., has simplified its air suspension system to provide a more responsive ride and easier maintenance. The division has eliminated the low pressure tank and has switched to a synthetic compressor oil. Oldsmobile claims the synthetic oil assures longer compressor life by eliminating carbon deposits.

U. S. Auto Output

Passenger Only

	1959	1958
January	545,757	489,515
February	478,484	392,132
March	576,085	357,048
April	578,825	316,594
4 Mo. Totals	2,179,151	1,555,289
May	.....	349,613
June	.....	337,446
July	.....	321,017
August	.....	180,447
September	.....	130,460
October	.....	261,701
November	.....	514,152
December	.....	593,920
Total	.....	4,244,045

Week Ended	1959	1958
Apr. 25	133,987	58,664
May 2	118,059	78,434
May 9	134,763	78,505
May 16	135,856	87,407
May 23	133,189†	86,082
May 30	120,000*	66,574

Source: *Ward's Automotive Reports.*
†Preliminary. *Estimated by STEEL.

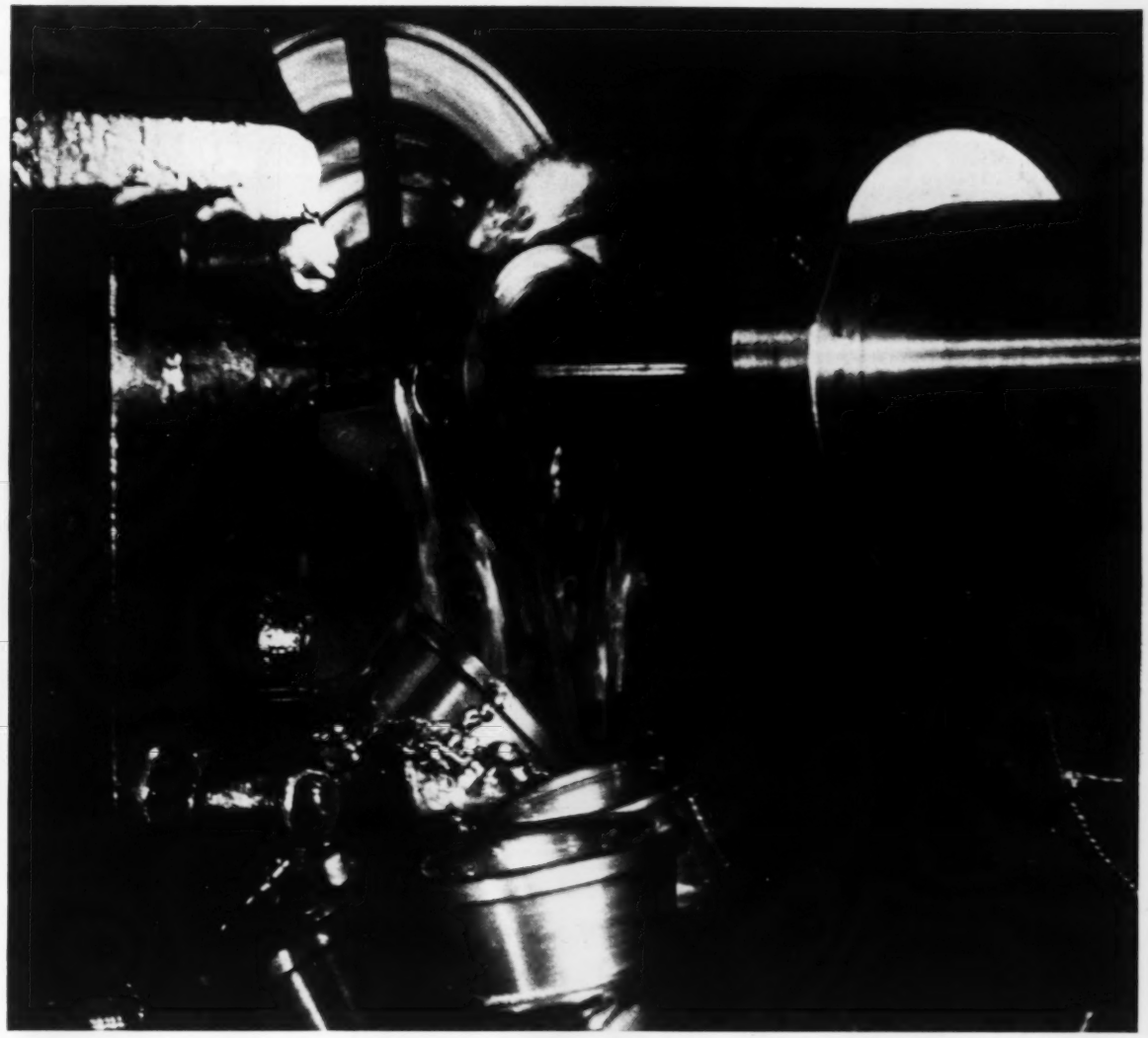

Photo courtesy of TYSON BEARING COMPANY, Division of SKF Industries, Inc.

Aristoloy uniform bearing quality steels keep green machining operations out of the red

ARISTOLOY STEELS

Physical soundness and the ability to deliver a part of uniform finish . . . these are prime requirements of a *bearing quality* steel. From the melting of carefully selected scrap in electric furnaces to final rolling and finishing, Aristoloy steels are carefully made . . . carefully controlled. The result is physical and chemical uniformity and freedom from inclusions, segregations, laps and seams that can increase rejections and make production costs soar.

For complete information about Aristoloy bearing grades 52100, 4620, 4720, 8620, and 4320, call the Copperweld representative in your nearest large city . . . or write today for NEW PRODUCTS & FACILITIES CATALOG.

COPPERWELD STEEL COMPANY

ARISTOLOY STEEL DIVISION • 4005 Mahoning Ave., Warren, Ohio • EXPORT: Copperweld Steel International Co., 225 Broadway, New York 7, N. Y.

ELPAR Clamp Trucks Double Warehouse Capacity

Iron Out Seasonal Production Troubles

• Two versatile ELPAR electric clamp trucks solved a warehousing problem at the Donora, Pa. Works of U. S. Steel's American Steel and Wire Division.

The seasonal demand for fence and welded reinforcing wire fabric necessitated additional storage space to accommodate material produced during the winter to meet normal spring and summer orders.

ELPAR engineers were asked to develop this versatile fork truck attachment which handles a wide variety of shapes and sizes of welded wire fabric and makes possible ceiling high stacking of coils.

Result — storage space was doubled and peak demands are met by off season production.

This is a typical example of how ELPAR trucks, backed-up with the experience of ELPAR's engineering staff can solve tough handling problems. You not only save through more efficient handling . . . you save on operating costs too.

You will be well repaid if you investigate the quality line of ELPAR electric powered industrial trucks.

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ELECTRIC TRUCKS

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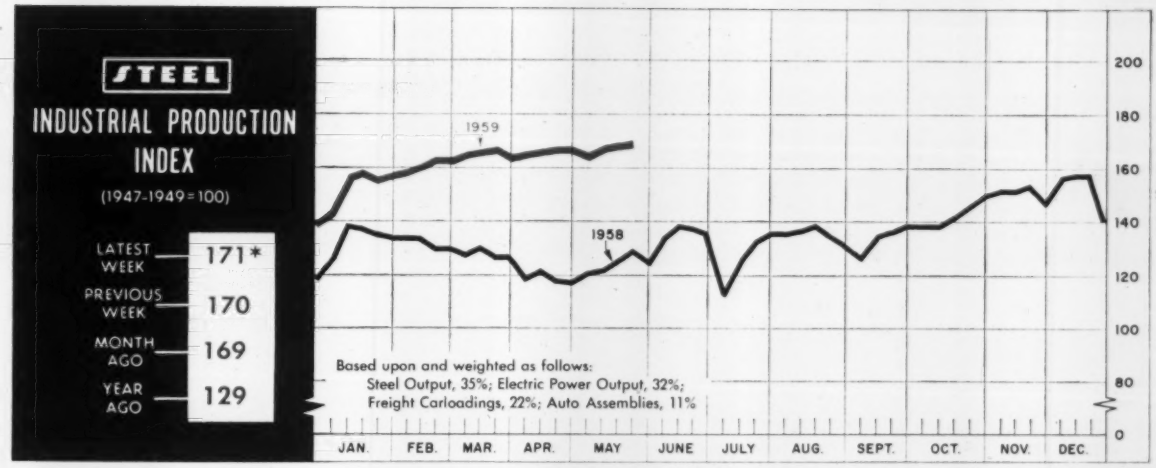
TWICE THE LIFE... ONE-THIRD THE OPERATING COST



*Week ended May 23.

Executives See Strong Second Half

UNCERTAINTY over the steel industry labor situation cast only a small shadow over the panel of industry experts at the 43rd annual meeting of the National Industrial Conference Board. They think the second half is going to be a rouser.

Steel strike or no, most of them expect a continuation of the current uptrend into 1960, with some slowdown in the third quarter. Typical was the comment of Clifford Hood, retired president of U. S. Steel Corp., who declared that a strike would naturally hurt the industry after its record performance of recent months. But sales in the fourth quarter should return to the levels of the earlier months of the year.

• **Autos**—L. L. Colbert, president of Chrysler Corp., stated: "In our industry we have never experienced a year in which a retail market as good as the one we are having in the first half was followed by a poor market in the second half. The same factors that have been at work in the early months of the year should continue to have a favorable effect on our market in the second half."

This would result in total sales of close to 6 million cars in 1959, with about 5.5 million accounted for by domestic makes. Production in the first half will be about 3,272,000 cars, 46 per cent higher than in 1958's corresponding period.

He listed as favorable factors: 1. Return of consumer confidence. 2. Record high employment. 3. Rising personal income. 4. Record high savings. 5. Ample credit. 6. Firmness in both price and sales of used cars.

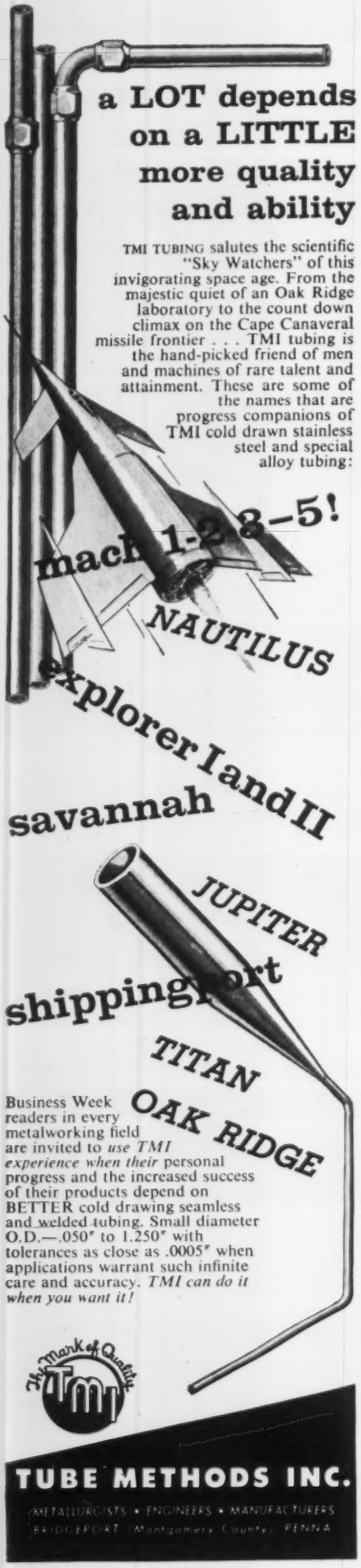
He predicted truck production of over 1 million units for the year.

• **Construction** — An increase in spending for new plants, but no construction boom, is the way H. C. Turner Jr., president of Turner Construction Co., described the second half. He pointed out that a

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1,000 net tons)[2]	2,671[1]	2,644	1,567
Electric Power Distributed (million kw-hr)	12,750[1]	12,684	11,316
Bituminous Coal Output (1,000 tons)	8,195[1]	8,405	7,318
Crude Oil Production (daily avg—1,000 bbl)	7,150[1]	7,178	6,256
Construction Volume (*ENR*—millions)	$468.2	$415.6	$588.1
Auto, Truck Output, U. S., Canada (*Ward's*)	168,673[1]	172,659	112,101
TRADE			
Freight Carloadings (1,000 Cars)	700[1]	694	571
Business Failures (Dun & Bradstreet)	311	265	327
Currency in Circulation (millions)[3]	$31,515	$31,505	$30,822
Dept. Store Sales (changes from year ago)[3]	+9%	+14%	−2%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$26,502	$22,992	$23,143
Federal Gross Debt (billions)	$285.2	$287.1	$274.9
Bond Volume, NYSE (millions)	$26.1	$30.0	$28.5
Stocks Sales, NYSE (thousands of shares)	15,970	18,115	12,537
Loans and Investments (billions)[4]	$95.4	$94.3	$91.8
U. S. Govt. Obligations Held (billions)[4]	$29.7	$28.9	$30.5
PRICES			
STEEL's Finished Steel Price Index[5]	247.82	247.82	239.15
STEEL's Nonferrous Metal Price Index[6]	222.5	222.4	195.4
All Commodities[7]	119.5	119.7	119.3
Commodities Other than Farm & Foods[7]	127.9	128.1	125.2

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1959, 2,831,486; 1958, 2,699,173. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-39=100. [6]1936-39=100. [7]Bureau of Labor Statistics Index, 1947-49=100.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TMI TUBING salutes the scientific "Sky Watchers" of this invigorating space age. From the majestic quiet of an Oak Ridge laboratory to the count down climax on the Cape Canaveral missile frontier . . . TMI tubing is the hand-picked friend of men and machines of rare talent and attainment. These are some of the names that are progress companions of TMI cold drawn stainless steel and special alloy tubing:
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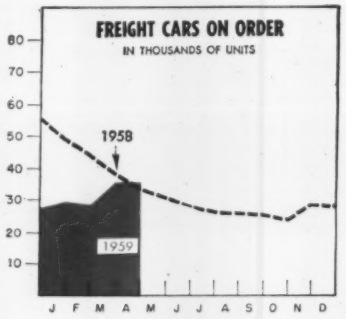
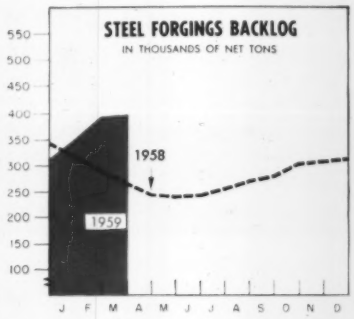
THE BUSINESS TREND





	Awards 1959	Awards 1958	Backlogs (end of month) 1959	Backlogs (end of month) 1958
Jan.	4,007	401	29,470	48,787
Feb.	1,806	287	28,789	43,750
Mar.	10,795	193	35,487	38,027
Apr.	3,736	278	35,479	32,908
May	....	1,370	.....	30,386
June	....	317	.....	27,757
July	....	376	.....	25,994
Aug.	....	1,773	.....	25,611
Sept.	....	1,580	.....	24,982
Oct.	....	781	.....	23,670
Nov.	....	6,295	.....	27,962
Dec.	....	3,830	.....	27,596
Total	....	17,481		

American Railway Car Institute. Charts copyright, 1959, STEEL.

	Shipments 1959	Shipments 1958	Unfilled Orders 1959	Unfilled Orders 1958
Jan.	113	108	353	318
Feb.	113	93	392	289
Mar.	129	92	396	266
Apr.	....	83	....	242
May	....	78	....	240
June	....	88	....	246
July	....	67	....	256
Aug.	....	80	....	279
Sept.	....	89	....	287
Oct.	....	100	....	303
Nov.	....	89	....	307
Dec.	....	113	....	313

U. S. Bureau of the Census. Data based on reports from commercial and captive forge shops with monthly shipments of 50 tons or more.

survey by *Engineering News-Record* indicates that modernization will account for 65 per cent of capital spending in 1959-60, but he added that a rising trend in industrial contract awards still means a higher level of new plant building for the balance of 1959 and into 1960.

In addition, he anticipates that commercial construction will continue to show substantial gains in the last half, and residential building will remain high (although tight money may prevent further expansion in the figures). Public works programs will probably remain at peak levels unless Congress fails to provide the necessary funds.

• **Railroads** — Capital expenditures in this industry will remain at low levels, perhaps 25 per cent below 1958's, despite the expected upturn of between 5 and 10 per cent in gross sales, predicted F. B. Whitman, president, Western Pacific Railroad Co. Business in the second half might fall somewhat below the level of the first half because of a steel strike, or barring that, an overaccumulation of inventories by manufacturers.

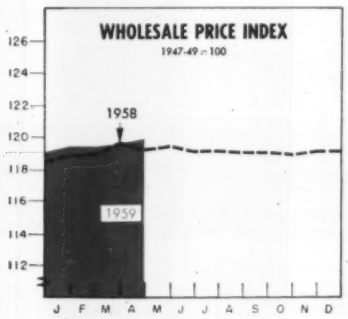
However, he predicted that railroad shipping costs will be driven down a bit in the second half because of an increasing number of applications for selective rate reduction.

• **Rubber**—H. E. Humphreys Jr., chairman of U. S. Rubber Co., anticipates a record year for the rubber industry, with the second half a little below the first half level. Such activity will be reflected in greater capital expenditures. The industry will spend about $165 million this year, compared with $134 million in 1958. But this will still be well below the peak capital spending of $201 million in 1956.

• **Aluminum**—One of the most optimistic forecasts came from R. S. Reynolds Jr., president of Reynolds Aluminum Co., who believes that his industry will come close to primary production of 1.9 million tons in 1959. This will be 13 per cent above the record set in 1956. (See Page 142 for more details.)

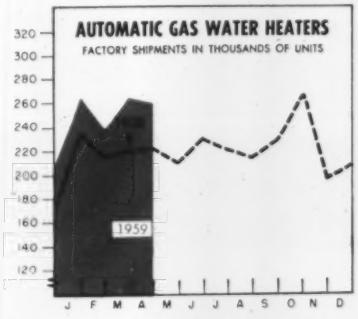
Lists Growth Industries

Metalworking and related industries account for nine of the top twenty segments of the national economy which are expected to show the most growth over the next



	All Commodities 1959	All Commodities 1958	Other Than Farm & Foods 1959	Other Than Farm & Foods 1958
Jan.	119.5	118.9	127.5	126.2
Feb.	119.5	119.0	127.8	125.7
Mar.	119.6	119.7	128.1	125.7
Apr.	120.0	119.3	128.3	125.5
May	....	119.5	....	125.3
June	....	119.2	....	125.3
July	....	119.2	....	125.6
Aug.	....	119.1	....	126.1
Sept.	....	119.1	....	126.2
Oct.	....	119.0	....	126.4
Nov.	....	119.2	....	126.8
Dec.	....	119.2	....	127.2

U. S. Bureau of Labor Statistics.



	Shipments—Units 1959	1958	1957
Jan.	266,200	235,400	214,900
Feb.	242,400	216,300	208,200
Mar.	267,300*	221,600	226,600
Apr.	261,900*	221,900	238,200
May	.....	210,000	233,400
June	.....	231,000	211,700
July	.....	221,400	192,500
Aug.	.....	215,500	210,300
Sept.	.....	230,000	215,500
Oct.	.....	265,900	234,700
Nov.	.....	196,100	173,500
Dec.	.....	207,300	172,800
Totals	.....	2,673,400	2,532,300

*Preliminary.
Gas Appliance Mfrs. Assn.

ten years, says Lionel D. Edie, chairman, Lionel D. Edie & Co. Inc. At the NICB meeting, he listed 60 industry groupings by growth characteristics, placing ten (growth of 100 to 200 per cent) at the top of the list. They are:

Guided missiles and products related to outer space.

Office equipment, including computers.

Electric energy.

Air transportation.

Electronics.

Aluminum.

Drugs.

Plastics.

Residential building.

Research and development.

Taking producers' durable equipment as a group, Mr. Edie predicts that it will fare better in the next ten years than it has in the last ten, with a 40 per cent increase.

Index Hits New High

STEEL's industrial production index inched up another point during the week ended May 23 to a preliminary 171 (1947-49 = 100), setting a record for the second consecutive week. Seasonal uptrends in output of electric power and freight carloadings accounted for the rise as production in the steel and auto industries remained stable at high levels. The index is expected to decline less than usual over the Memorial Day week because the holiday falls on a Saturday. Some companies will give Friday off while others will take the holiday on Monday, which will spread the production dip over two weeks instead of one.

Building at Record Peak

Construction contract awards during April soared to nearly $3.8 billion, a record for the month, reports F. W. Dodge Corp. A seasonally adjusted construction index announced last week by Dodge shows that contracts reached 299 per cent of the 1947-49 base, an all-time high. The previous high for the index, which has been computed back to the base period, was set in June, 1958.

While the gain was across the board, Dr. George Cline Smith, vice president and economist, says the most encouraging rises occurred in contracts for schools and factories, two categories which lagged the uptrend in early 1959. Manufacturing building contracts were up 46 per cent from April of last year.

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Clean, Strong, Unified Threads from lot to lot!

Assure interchangeability with bolts and nuts that fit as they should—uniform from fastener to fastener, order to order.

Our quality controlled bolts and nuts meet exacting tolerances for proper fits and strong connections. Smooth-turning threads assemble easily yet snugly, and give maximum holding power.

Always insist on dependable Screw and Bolt Corporation of America high-quality fasteners.

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SCREW AND BOLT CORPORATION OF AMERICA
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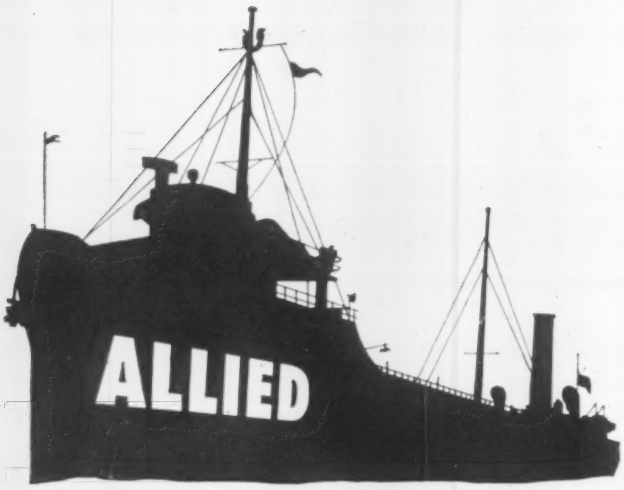

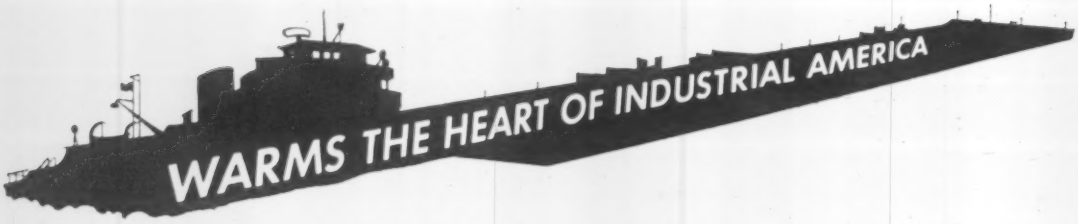

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Allied's efficient storage-and-transport system serves the heart of Industrial America, from the Mississippi to the Alleghenies . . . from Alabama to Canada. In this area, Allied can meet any fuel oil requirement. Write, wire or phone us today.

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Division of Ashland Oil & Refining Company
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HERSHEL C. OSBORN
Interstate Drop Forge exec.

PAUL A. MILLER
Eaton-Reliance gen. mgr.

L. H. SHIPPEE
AMC purchasing post

RICHARD H. LEWIN
Cerro de Pasco v. p.

Hershel C. Osborn, vice president and plant manager, **Interstate Drop Forge Co.,** Milwaukee, was advanced to senior vice president. He will devote himself to development of the Special Products Div., and to the study of future plans of expansion and improvement of present and expected manufacturing operations. **Stanley J. Renton,** superintendent, was promoted to vice president and plant manager. **Werner G. Bartell** was made treasurer and assistant secretary.

Paul A. Miller was appointed general manager, **Reliance Div.,** Massillon, Ohio, Eaton Mfg. Co. He was general manufacturing manager, Hardware & Accessories Div., Ford Motor Co.

H. Glenn Bixby was elected president, **Bryant Chucking Grinder Co.,** Springfield, Vt., subsidiary of Ex-Cell-O Corp., Detroit, of which Mr. Bixby is president. **N. A. Leyds** was elected vice president and general manager of Bryant.

L. H. Shippee was made director of purchasing, Automotive Div., **American Motors Corp.,** Detroit. He succeeds the late **James A. Lee Sr.** Mr. Shippee was assistant to the director of purchasing. **C. L. Epker** was made assistant director of purchasing for the division.

Thomas V. Jones was elected president, **Northrop Corp.,** Hawthorne, Calif., succeeding the late **W. C. Collins.** Mr. Jones was a senior vice president. **James Allen,** formerly vice president and assistant to the president, was named a corporate vice president and assistant to the chairman.

P. Willard Crane was elected vice president, **Cincinnati Milling Machine Co.,** Cincinnati. He is director of research. **Richard A. Didday** was elected vice president of the sales subsidiary, Cincinnati Milling & Grinding Machines Inc. He recently returned from managing the company's plant in Holland.

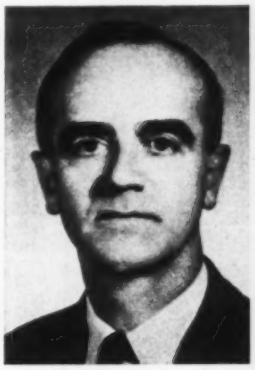
Richard H. Lewin was appointed vice president, **Cerro de Pasco Corp.,** New York, in charge of domestic nonferrous metal fabricating operations. He was president, Lewin-Mathes Co., a division.

Andrew B. Pulliam was appointed president and general manager, **Marvel-Schebler Products Div.,** Decatur, Ill., Borg-Warner Corp. He succeeds **R. C. Ingersoll,** who relinquishes duties with Marvel-Schebler to devote more time to company-wide responsibilities. Mr. Pulliam was the division's vice president and general manager.

W. E. Rowe was named vice president-manufacturing, **Long Mfg. Div.,** Detroit, Borg-Warner Corp. He was director of manufacturing for all Long plants in Detroit. **Daniel W. Lysett** was made vice president-sales.

J. Kenneth Sloan was made sales manager, **Wagener Pump Div.,**

H. GLENN BIXBY



N. A. LEYDS
Bryant Chucking Grinder executives

P. WILLARD CRANE

RICHARD A. DIDDAY
Cincinnati Milling executives

N. H. COLLISSON

M. L. HERZOG

Olin Mathieson—Metals Div. executives

DONALD H. EVORY

JOHN C. HOOVER

Burke Steel appointments

Canton Stoker Corp., Canton, Ohio.

N. H. Collisson, a corporate vice president, was named operating head of the Metals Div., **Olin Mathieson Chemical Corp.,** New York. **M. L. Herzog,** also a corporate vice president, was made general manager-operations in the division. Mr. Collisson, formerly in charge of production and engineering for the corporation, also is president of Ormet Corp., a subsidiary jointly owned by Olin and Revere Copper & Brass Inc. Mr. Herzog was in charge of the film activities of the Packaging Div. of Olin Mathieson prior to his appointment to the corporate staff this year.

Richard H. Church was named director of research, **A. F. Holden Co.,** Detroit.

H. H. Whitmore was elected executive vice president, **Jones & Lamson Machine Co.,** Springfield, Vt. **J. C. Hebert** was elected vice president. **R. S. Jones** was appointed general manager.

Burke Steel Co. Inc., Rochester, N. Y., promoted **Donald H. Evory** from controller to purchasing agent; **John C. Hoover** from treasurer and assistant general manager to vice president-marketing.

Walter H. Schefft, former assistant general manager, was made general manager of **Eaton Mfg. Co.'s** Stamping Div., Cleveland. He succeeds **E. M. DeWindt,** recently made assistant director of sales for the company.

Harold C. Lumb was named vice president in charge of legal and public affairs at **Republic Steel Corp.,** Cleveland. **William J. DeLancey,** former assistant general counsel, succeeds Mr. Lumb as general counsel.

A. J. Verax, former director of purchasing, **Crosley Div.,** Avco Corp., Cincinnati, was made plant manager. **R. B. Megrue,** who has divided his efforts as plant manager between Crosley's Evendale, Ohio, and Cincinnati facilities, now devotes full time to the Evendale plant.

Robert A. McClure was made general superintendent of **United States Steel Corp.'s** Homestead (Pa.) District Works, succeeding **Robert W. Graham,** recently named general manager, operations-steel. Mr. McClure was general superintendent, Gary Sheet & Tin Mill, Gary, Ind. **Theodore J. Koenig,** former assistant general superintendent at Homestead, was named to succeed Mr. McClure. **Dr. Dennis J. Carney** succeeds Mr. Koenig.

H. K. Porter Company Inc. appointed **R. G. Vervaeke** manager, Pascagoula Works, Pascagoula, Miss.; **Walter A. Tallon,** geologist, Refractories Div., Pittsburgh. Mr. Vervaeke replaces **W. R. Shaw,** resigned. Mr. Vervaeke was general manager, Chemical Lime Co., Baker, Oreg., and also general superintendent of mines at Gladding-McBean & Co. Mr. Tallon will supervise the Refractories Div.'s raw material exploration and procure-

H. H. WHITMORE

Jones & Lamson exec. v. p.

HAROLD C. LUMB

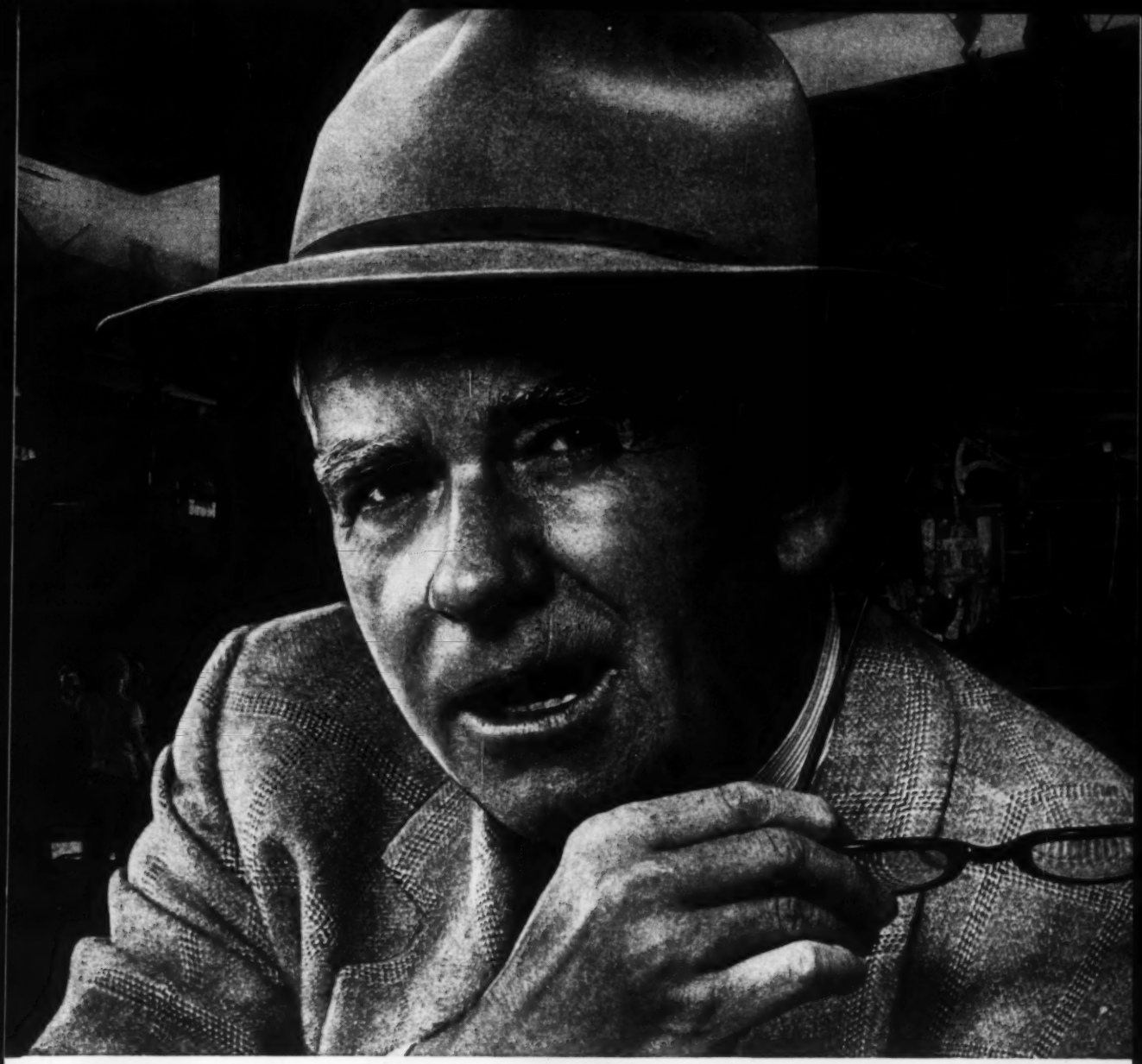
Republic Steel legal post

A. J. VERAX

Crosley plant manager

R. G. VERVAEKE

Porter works manager



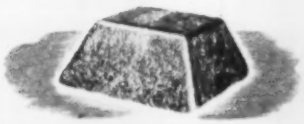
"I stock only one high-carbon chrome—refined chrome"

Steel mill and foundry operators are cutting chromium costs by using the new ELECTROMET refined chrome for all high-carbon chromium additions. Inventory, handling, and storage are greatly simplified by stocking only this one high-carbon chromium alloy. It is ideal for use as:

- **A base charge for stainless steels.**
- **Final additions for aircraft, bearing, and tool steels.**
- **Cupola or ladle additions for cast iron.**

Refined chrome combines the economy of regular charge chrome with the maximum cleanliness and low residual element content of conventional high-carbon ferrochrome. For facts on how refined chrome can reduce your costs, contact your UNION CARBIDE METALS representative.

UNION CARBIDE METALS COMPANY, Division of Union Carbide Corporation, 30 East 42nd Street, New York 17, N. Y.



Convenient 20- and 40-pound pigs of refined chrome are magnetic, allowing easy handling with an electromagnet.

UNION CARBIDE METALS

***Electromet** Brand Ferroalloys and other Metallurgical Products*

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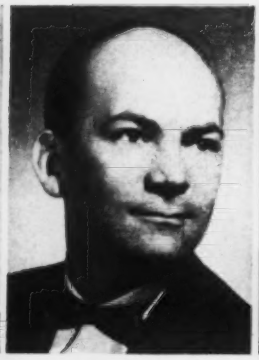
CHARLES PETERSON
Veet chief engineer



WILLIS R. WALLING
Swan Engineering exec. v. p.

E. V. GILLIS
Jarecki plant manager

ROBERT E. HEBERT
Vanadium-Alloys post

DONALD A. SUTHERLAND
United Aircraft president

GILBERT T. BOWMAN
Rockwell Mfg. v. p.

ment activities. He was with the West Virginia Geological Survey.

Robert E. Hebert was named manager of a new Vacuum Melting Dept. at **Vanadium-Alloys Steel Co.**, Latrobe, Pa. He will supervise operations of the consumable arc vacuum melting furnace recently placed in operation. **C. J. Stalnaker** was made product metallurgist in the department.

Donald A. Sutherland was elected president, **United Aircraft Products Inc.**, Dayton, Ohio. He was general manager, Electronics Div., Elgin National Watch Co., in Burbank, Calif.

John C. Jewett was named vice president - sales, Pittsburgh Div., **Screw & Bolt Corp. of America.** He was assistant vice president-sales, Gary Div.

George T. Brennan was elected vice president, **Vascoloy-Ramet Corp.**, subsidiary of Fansteel Metallurgical Corp., North Chicago, Ill. He continues as manager of the division.

Gilbert T. Bowman, assistant vice president, Meter & Valve Div., **Rockwell Mfg. Co.**, Pittsburgh, was elected a vice president of the company. He will be in charge of the International Div. and Petroleum & Industrial Div. **John P. MacCrossen,** western regional sales manager, Delta Power Tool Div., was named manager of planning and assistant to the vice president, Power Tool Divisions. He will be in Pittsburgh. **W. H. Richter** was made western regional sales manager, San Francisco. **Robert B. Humphrey,** east-central regional manager, Delta Power Tool Div., was named sales manager for the Power Tool Div. of Rockwell Mfg. Co. of Canada Ltd., Guelph, Ont. He is succeeded at Pittsburgh by **Harold Jonas.**

Ervin F. Borisch, executive vice president, **Milwaukee Gear Co.**, Milwaukee, was elected president to succeed his father, **Emil B. Borisch,** now chairman. **E. Jack Borisch** was named executive vice president. **Fred L. Heine** was elected vice president-engineering.

Charles Peterson was made chief engineer, **Veet Industries,** East Detroit, Mich. Prior to his recent affiliation with Veet, he was with Futurmill Inc.

Willis R. Walling was appointed executive vice president, **Swan Engineering Co.**, Bloomfield, N. J. He was sales manager.

E. V. Gillis was made plant manager, Instrument Div., **Jarecki Corp.**, Grand Rapids, Mich. In addition to managerial duties, he is in charge of all production operations.

John P. Magos was appointed director of engineering for **Crane Co.**, Chicago. He replaces **Dr. Maurice Nelles,** who resigns as vice president-engineering.

James T. McFadzean was made assistant sales manager, **Butterfield Div.**, Union Twist Drill Co., Derby Line, Vt. He was manufacturing superintendent of the division's Rock Island plant in Rock Island, Que.

Howard D. Hartough was elected president, Chemical Products Div., **Chemetron Corp.**, Chicago. For the present, he has headquarters in Louisville, supervising operation of the division. He has been general manager of Girdler Catalysts, one of the division's operations.

OBITUARIES...

Carl F. Norberg, 60, president, **Electric Storage Battery Co.**, Philadelphia, died May 19.

Dr. Louis N. Ridenour Jr., 47, vice president, **Lockheed Aircraft Corp.**, Burbank, Calif., died May 21.

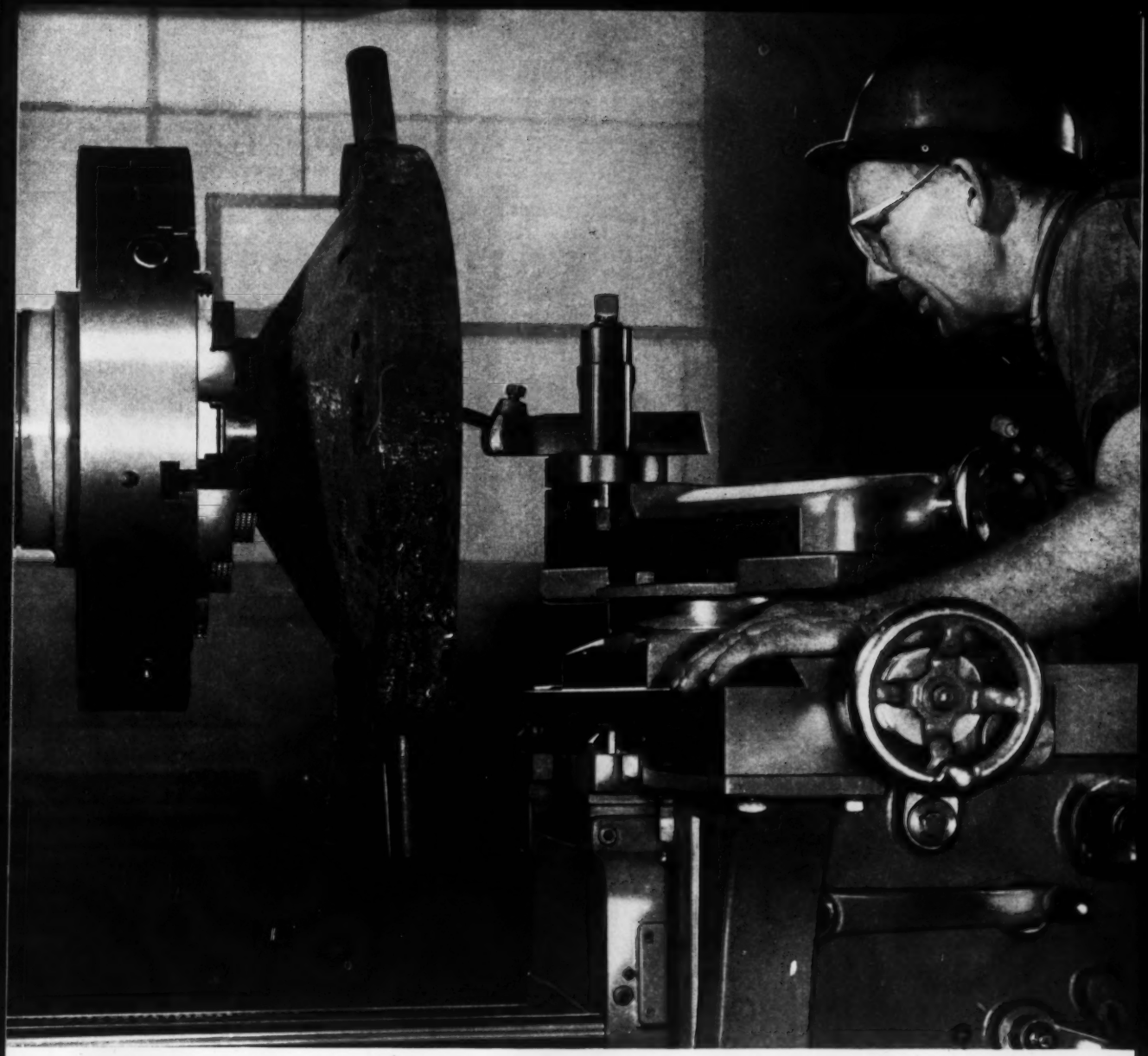
John C. Lincoln, 92, founder of **Lincoln Electric Co.**, Cleveland, died at his home in Scottsdale, Arizona, May 25.

Alton F. Davis, 69, vice president and secretary, **Lincoln Electric Co.**, Cleveland, died May 25.

C. H. Steele, 65, vice president, **Anaconda Co.**, Butte, Mont., died May 19.

Gail M. Hoover, 45, purchasing agent, **Precision Metal Workers Corp.**, Chicago, died May 18.

Carl Malm, 51, production manager, **S & M Mfg. Co.**, Milwaukee, died May. 12.



Operator machines $1200 oblique-shaped, 31" diameter cross-head plate on Nebel extension bed gap lathe in half the usual time.

Odd shapes to 40" dia. machined to .0004" in ½ time on NEBEL extension bed gap lathe

The Port Arthur, Texas plant of Koppers Co., Inc., works with flammable gas under high pressures. Equipment maintenance demands perfect machining, with accuracy to four ten thousandths inches. The firm installed a Nebel extension bed gap lathe to obtain this precision, plus the extreme versatility necessary to swing large, odd-shaped parts.

The 28"/50" Nebel, with its 120" centers, 52" swing through the gap, and load-carrying capacity of over 37,000 pounds, satisfies Koppers' need for a "universal" unit. It has eliminated "shut-down time" in production, machining overnight pieces that previously required weeks of delay for replacement, being impossible to chuck or face on an ordinary lathe. Often, the machine "doubles" as an engine lathe.

Set up and geared for metric threading, ranging from 1.75 to 80 threads per mm., offering a precision impossible and impractical with competitive machines, the Nebel cuts machining time in half on most jobs, including the numerous special alloys used by Koppers.

Learn how the incomparable accuracy and flexibility of a Nebel extension bed gap lathe can save you time, money and space. Write for free detailed bulletins on the complete line today!

NEBEL LATHES

Nebel Machine Tool Corporation
3405 Central Parkway, Cincinnati 25, Ohio

Inspectors, riding on special buggies, check inside seams and surfaces of pipe made at Kaiser Steel's expanded Napa, Calif., plant

Kaiser Boosts Steel Pipe, Pure Aluminum Capacities

A $2 MILLION expansion of the Fabricating Div., Kaiser Steel Co., at Napa, Calif., is finished. It doubles the plant's pipemaking capacity to 840,000 tons annually. A program to triple production of superpurity aluminum at the Mead, Wash., reduction plant of Kaiser Aluminum & Chemical Corp. is beginning. Annual capacity will be 900,000 lb.

The Napa project included a 50,000 sq ft addition to the pipe mill for additional welding, facing, expanding, and testing facilities. The plant will produce expanded, electricweld pipe 20 to 36 in. in diameter and can increase the upper limit to 42 in. Electric resistance weld pipe 6⅝ to 20 in. in diameter will also be made.

A second hydraulic expander, 60 ft long, has been installed. It encloses the welded pipe while water is pumped in at tremendous pressure. This operation tests the soundness of the weld, gives the pipe its final diameter, and increases tensile strength via cold working.

• **Fast Forming Line**—The forming line shapes 40 ft long plates into pipe at the rate of a piece a minute. After manual tackwelding, the pipe is sent through 16 automatic inside and outside welding machines. It is then expanded under pressure (up to 5000 psi) to size and straighten each piece.

Steel plates for the pipe are rolled at Kaiser's Fontana, Calif., plant where a $214 million expansion project was recently completed. In addition to pipe production, the Napa facility fabricates a variety of steel products.

• **Aluminum Expansion**—Work is scheduled to begin immediately on two refining cells at Mead, Wash. The cells, said to be among the largest of their type, will refine aluminum to a purity of over 99.99 per cent. Production is expected to start this fall. Cost: About $100,000.

Major applications of superpurity aluminum include petroleum catalysts for producing high octane gasoline, foil for electric capacitators, and decorative uses in consumer products such as automobiles, appliances, and costume jewelry. The Mead plant went into operation four years ago.

Slabbing Mill Planned

Bethlehem Steel Co. is planning a new 45 x 90 in. slabbing mill for its Lackawanna, N. Y., plant, reports A. B. Homer, president. Cost of the unit was not disclosed.

Rheem Sells Coast Plants

Rheem Mfg. Co., New York, has sold its Downey and Riverside, Calif., plants to Aerojet General Corp., Azusa, Calif. The transaction involved transfer of employees, production, and facilities, including 600,000 sq ft of plant space. Sale was in cash, but terms were not disclosed.

Convair Opens New Lab

Convair Div., General Dynamics Corp., San Diego, Calif., has completed a $2 million structures research laboratory. It will be used to simulate extreme loads and temperatures encountered in high speed flight of aircraft, missiles, and space vehicles.

Lockheed Acquires Stavid

Lockheed Aircraft Corp., Burbank, Calif., will acquire Stavid Engineering Inc., Plainfield, N. J., on the basis of 2½ shares of Lockheed stock for each share of Stavid stock. No changes in policies or management are contemplated.

Stavid, formed after World War II, specializes in military electronics.

Its sales came to $11.3 million in 1958. Lockheed has recently expanded its electronics activities. The firm had sales of $962.7 million last year.

Electronics Firm Started

A new electronics firm, General Magnetics Inc., has been formed at Minneapolis. The company will specialize in research, design, and production of magnetic components.

Dupont Changes Name

E. W. & A. P. Dupont Co., Patterson, La., has changed its name to Dupont Inc. The firm makes steel workboats and oil rig equipment.

Avco Opens R&D Lab

Avco Mfg. Corp., New York, has opened its new $23 million research and development laboratory at Wilmington, Mass. The six buildings have 484,600 sq ft of floor space. The facility will be used for space missile program work.

AEC to Close Uranium Mill

The Atomic Energy Commission will close its only uranium mill about Jan. 1, 1960. The Monticello, Utah, plant is operated under an AEC contract by National Lead Co. Inc. It has a capacity of 300 tons of ore, about the minimum economic operating rate. Deliveries in recent months have averaged about 100 tons daily. After closing, the mill will be put on standby.

New Companies Formed

Universal Crankshaft Co. has been formed at Bowling Green, Ohio. The firm has leased space in the old Royal Mfg. Co. plant.

Wisconsin Ore Processing Inc., Cuba City, Wis., has been incorporated to smelt zinc and lead ores of the region.

After a year and a half of operation as a division of Reade Mfg. Co., Jersey City, N. J., Thermex Metallurgical Inc., Lakehurst, N. J., will be made a separate corporation. The firm makes welding materials and equipment.

NEW OFFICES

Chase Brass & Copper Co. has moved its Indianapolis warehouse to 1609 Oliver Ave. The facility doubles the firm's stock storage space and adds 2500 sq ft of office space.

Bailey Meter Co., Cleveland, has moved its district office to 875 Greentree Rd., Pittsburgh 20, Pa. Resident engineer, R. T. Keller, has a new office at 1143 Mary St., Jacksonville 7, Fla.

International Lubricants Corp., New Orleans, has moved its executive offices and laboratory facilities into an $850,000 building on Airline Highway northwest of the city.

Hunt Valve Co. has started constructing a 12,000 sq ft office building on E. State Street, Salem, Ohio.

Allied Aluminum Products Inc., has moved its offices, showrooms, and warehouse to a new building at 2265 Springboro Park, Dayton, Ohio.

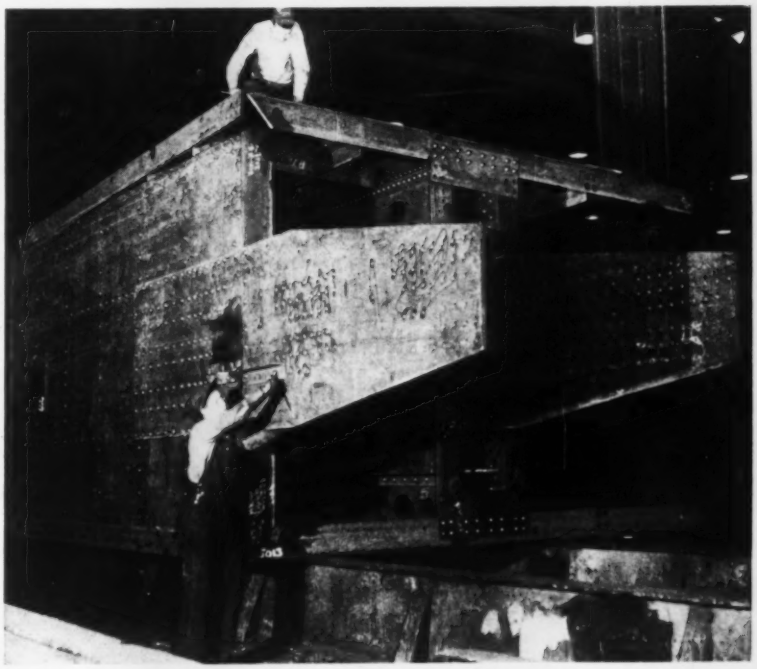
National Northern Div., American Potash & Chemical Corp., has opened a midwest area office at 70 Boundbrook Dr., Dayton, Ohio. Earl J. White Jr. is manager.

CONSOLIDATIONS

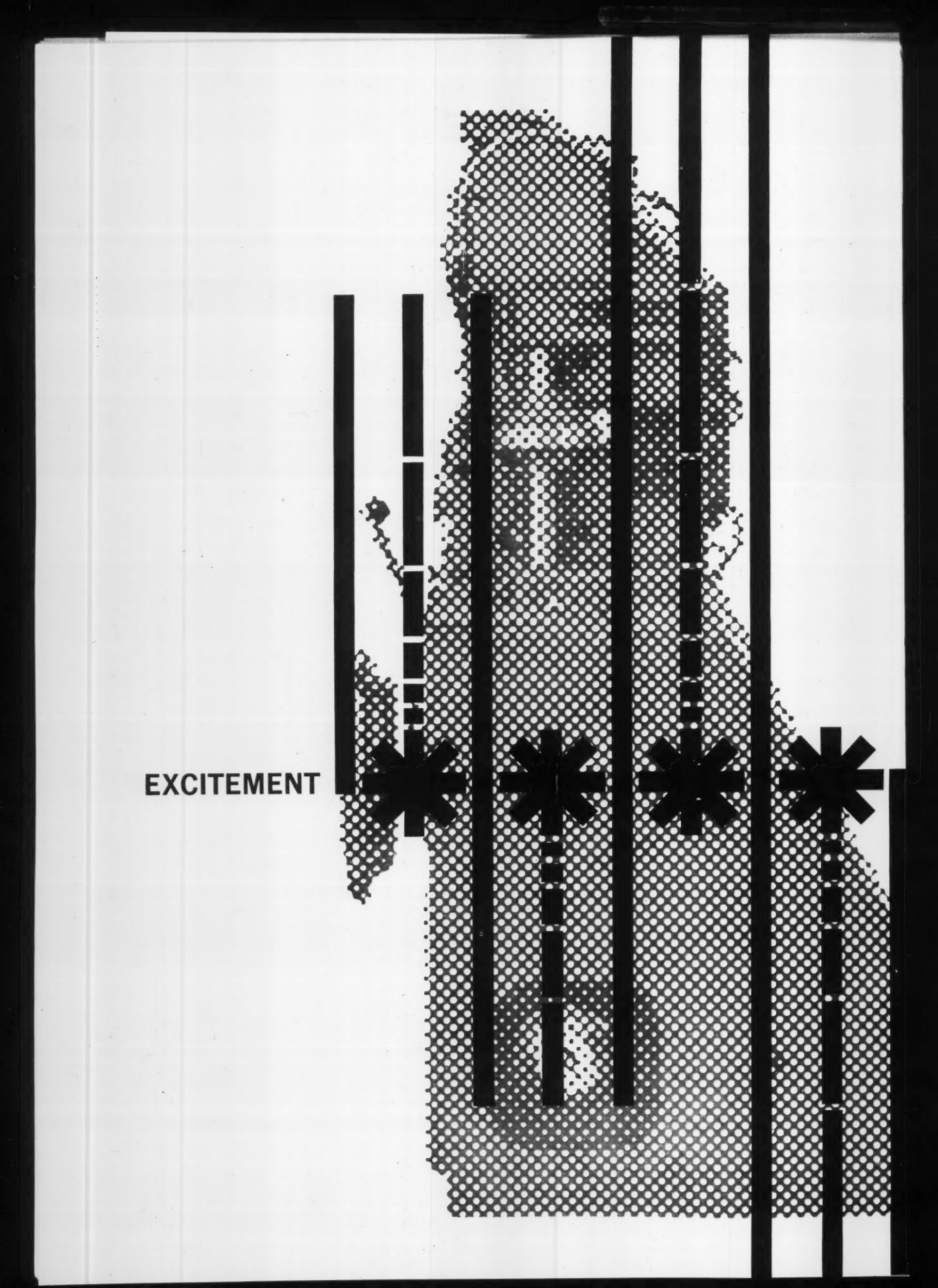
Textron Inc., Providence, R. I., has agreed to purchase **Pittsburgh Steel Foundry Corp.**, Glassport, Pa., for about $5.5 million. The sale is subject to approval by Pittsburgh stockholders. Textron would operate the company as a division. No management, policy, or personnel changes are planned.

Acoustica Associates Inc., Mineola, N. Y., manufacturer of ultrasonic equipment, has acquired **Universal Dynamics Corp.**, Santa Bar-

(*Please turn to Page* 80)



THIS COUNTERWEIGHT BOX SECTION will be part of a vertical lift bridge which is to span Portage Lake between Houghton and Hancock, Mich. Three sections form each box. Most of the 7000 tons of steel used in the four lane, double deck bridge will be fabricated by American Bridge Div., U. S. Steel Corp., Gary, Ind. Cost: $11 million

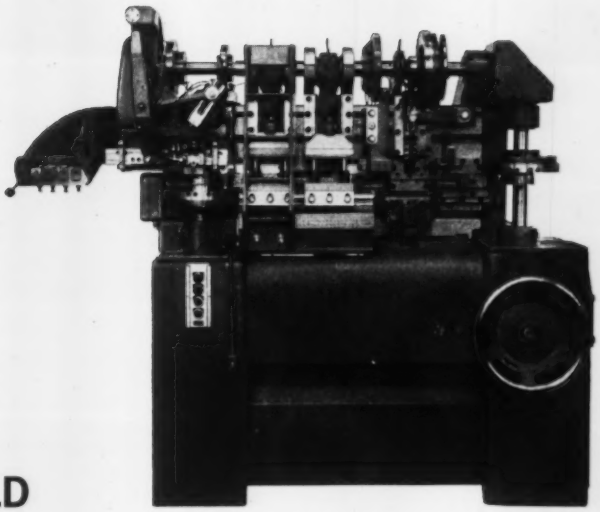

EXCITEMENT

Once in a blue moon, a really exciting new production machine is developed . . . and this is it!

It's the Torrington **Verti-Slide** which promises a genuine revolution in the production of just about everything in strip forming that is now being produced by progressively tooled presses.

Single-handed, the Torrington **Verti-Slide** has already demonstrated its ability to replace as many as six presses in high speed precision production of complex parts.

Cooler heads than ours are telling **us** that it's the most exciting new development in its field in half a century.



IN THE PRODUCTION WORLD

Write or call today for complete data—or a Torrington sales engineer.

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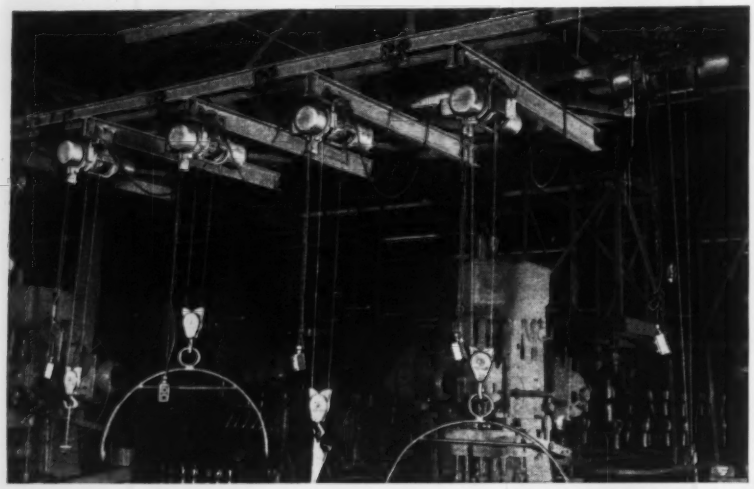
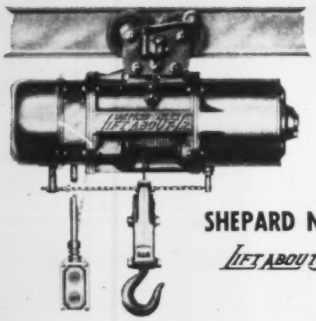
. . . on your production line



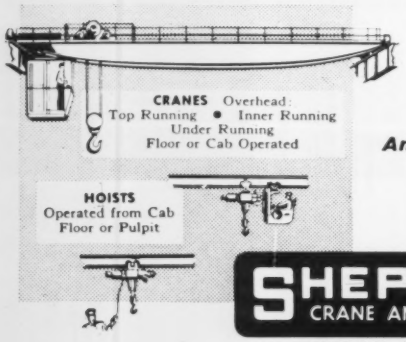


KEEP PRODUCTION on the move

. . . with a Shepard Niles Liftabout-Jr. This husky, light-service hoist does all your back-breaking lifting . . . enables one man or woman to move more material at lower cost.

Low in cost, the Liftabout-Jr. features dependable wire rope hoisting. Available in 250, 500, 1000 or 2000 lb. capacities . . . parallel or cross-mounted with bolt, hook or trolley suspension.

SHEPARD NILES LIFTABOUT-JR.



• Write for latest Liftabout-Jr. Bulletin . . . and ask to have a Shepard Niles representative call.

America's Most Complete Line of Cranes and Hoists Since 1903

SHEPARD NILES
CRANE AND HOIST CORPORATION

2378 Schuyler Ave., Montour Falls, N. Y.

(*Continued from Page 77*)

bara, Calif., maker of piezoelectric ceramics used in ultrasonic and sonar equipment.

Vendo Co., Kansas City, Mo., has acquired **Stoner Mfg. Co.**, Aurora, Ill. Both firms manufacture vending equipment.

Allis-Chalmers Mfg. Co., Milwaukee, has purchased **Tractomotive Corp.**, Deerfield, Ill.

Revere Copper & Brass Inc., New York, has agreed to purchase **Edes Mfg. Co.**, Plymouth, Mass., through an exchange of stock. Edes manufactures photoengraving metals.

Charleston Drydock Co., Charleston, S. C., a wholly owned and newly formed subsidiary of Maryland Shipbuilding & Drydock Co., Baltimore, has acquired substantially all the assets of **Charleston Shipyards Inc.**, Charleston.

NEW PLANTS

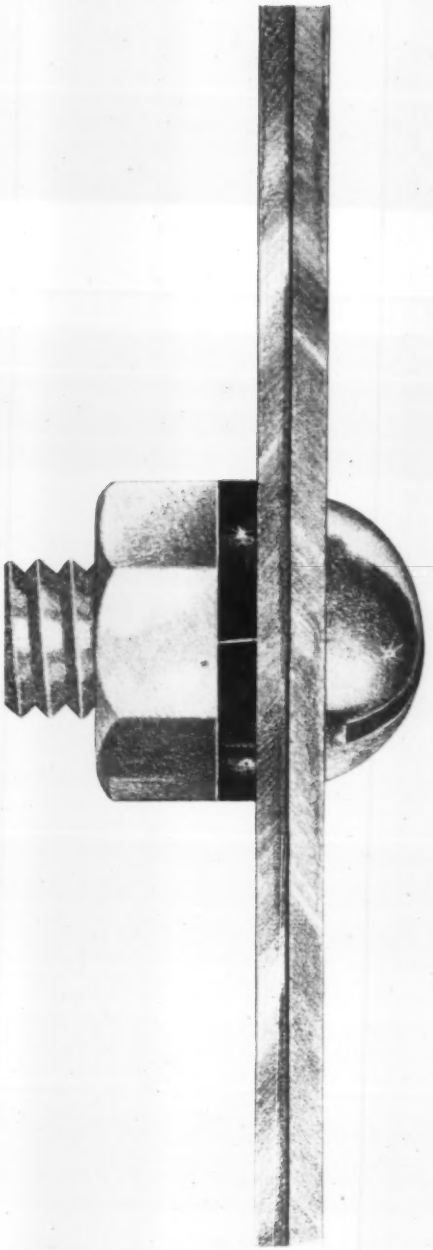
H. W. Tuttle & Co., has moved its production and office facilities to Tecumseh, Mich. Manufacturing area has been increased by one-third.

A.I.T. Diamond Tool Co. will build a new plant adjoining its present facilities at 8221 N. Kimball Ave., Skokie, Ill. The building will house additional production space, new offices, the Research & Development Div., and a demonstration and schooling section.

Funk Mfg. Co., Coffeyville, Kans., has completed a plant expansion program adding 13,000 sq ft of floor space. The power transmission firm's plant now contains over 23,000 sq ft.

Singer Mfg. Co., New York, has unveiled its sewing machine plant at Elizabethport, N. J. The 180,000 sq ft facility can produce 5000 machines per week, plus 5000 part sets for its Anderson, S. C., assembly plant.

Niagara Steel Finishing Co., Ni-



WHERE TIGHTNESS IS VITAL

No substitute has ever been found for a quality, properly-engineered helical spring lock washer. No other device has ever been found to combat looseness in bolted assemblies caused by thread wear, metal stress or bolt elongation. Yet, an improperly fitted helical spring washer is little better than none at all. That is why, when you specify spring washers, you should be sure you are getting the particular size and type which will do the best job for you. To be sure, consult the Eaton-Reliance spring washer specialist whose business is helping you choose the right washer to do the job. Eaton-Reliance offers a full range of sizes and types for every application—and engineering service for every problem. Write for our special Spring Lock Washer Engineering Bulletin.

EATON®

EATON

RELIANCE DIVISION

MANUFACTURING COMPANY

514 CHARLES AVENUE • MASSILLON, OHIO

SALES OFFICES: New York • Cleveland • Detroit • Chicago • St. Louis • San Francisco • Los Angeles

PRODUCTS: Engine Valves • Tappets • Hydraulic Valve Lifters • Valve Seat Inserts • Jet Engine Parts • Hydraulic Pumps Truck and Trailer Axles • Truck Transmissions • Permanent Mold Iron Castings • Automotive Heaters and Air Conditioners Fastening Devices • Cold Drawn Steel • Stampings • Forgings • Leaf and Coil Springs • Dynamatic Drives and Brakes Powdered Metal Parts • Gears • Variable Speed Drives • Speed Reducers • Differentials • Centralized Lubrication Systems

TEXACO ORGANIZED LUBRICATION CAN HELP YOU...

Get rid of the "guns" that "misfire"

His grease guns are aimed at your profits; they can help boost them—or eliminate them altogether. Here's why:

You used to need a different grease for nearly every job. That meant 20 or 30 lubricants in the plant, with the almost inevitable danger of misapplication — and damaged machinery.

Unless you're operating on the basis of a modern lubrication survey, *the chances are that this situation still exists in your plant!*

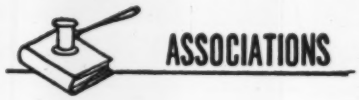
A Texaco Organized Lubrication Plan uses a minimum number of proper oils and greases—including newly developed multipurpose lubricants—to reduce your inventory by as much as 80% and virtually eliminate this problem.

Get the details on Texaco Organized Lubrication. Contact your local Texaco Lubrication Engineer or write for "Management Practices that Control Costs via Organized Lubrication."

Texaco Inc., 135 East 42nd Street, New York 17, N. Y., Dept. S-101.

LUBRICATION IS A MAJOR FACTOR IN COST CONTROL

agara Falls, N. Y., has sold its plant and property at 1700 College Ave. to **Pittsburgh Metallurgical Co.**, also of Niagara Falls. Niagara is building a plant on Hyde Park Boulevard, that city.



ASSOCIATIONS

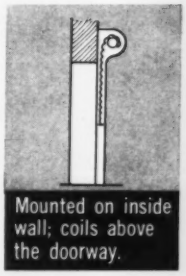
National Industrial Distributors' Association, Philadelphia, elected these officers: President, Wallace H. Campbell, Campbell Industrial Supply Co., Seattle; first vice president, Miles I. Stray, Charles A. Templeton Inc., Waterbury, Conn.; second vice president, John D. Williams, Mau-Sherwood Supply Co., Cleveland.

National Association of Architectural Metal Manufacturers, Chicago, elected these officers: President, Iron & Steel Div., John T. Edwards Jr., J. T. Edwards Co., Columbus, Ohio; president, Nonferrous Div., S. M. Olson, C. W. Olson Mfg. Co., Minneapolis; president, Tablet & Letter Div., E. P. Benson, A. J. Bayer Co., Los Angeles; president, Metal Curtain Wall Div., Ralph L. McKenzie, Flour City Ornamental Iron Co., Minneapolis; president, Store Front & Entrance Div., D. D. Williams, Brasco Mfg. Co., Harvey, Ill.; secretary, William A. Boesche, Ornamental Iron Work Co., Akron; treasurer, Emil M. Pollak, Illinois Bronze Works Inc., Chicago. All division presidents are vice presidents of the parent association.

New officers of **American Society of Lubrication Engineers,** Chicago, are: President, Dr. A. B. Wilder, E. I. du Pont de Nemours Co., Chicago; secretary, A. E. Cichelli, Bethlehem Steel Corp., Bethlehem, Pa.; treasurer, C. C. Blaisdell, Penola Oil Co., Chicago. C. L. Willey, Chicago, was reappointed executive secretary.

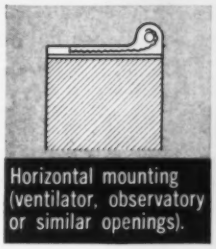
Liquefied Petroleum Gas Association Inc., Chicago, elected these officers: President, F. Leslie Fagan, Gem Automatic Gas Co., Granite Quarry, N. C.; first vice president, R. J. Munzer, Petrolane Gas Service

(*Please turn to Page* 88)


Mounted on inside wall; coils above the doorway.

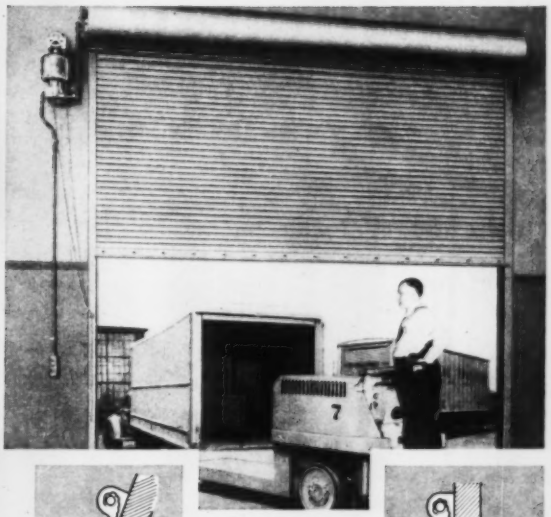
On outside wall; leaves all ceiling space clear.

Hood under lintel or concealed in the wall.


Horizontal mounting (ventilator, observatory or similar openings).

For VERSATILE Door Efficiency in any type of building or doorway construction

Kinnear Rolling Doors

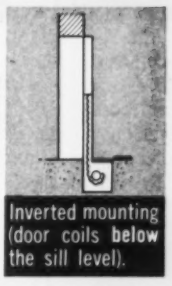


Sloping doorway (as for hoppers, chutes, etc.).

Kinnear Steel Rolling Fire Doors on either side of wall.*

Hood above roof or upper floor (no headroom needed).

Hood above lintel or atop wall (permits low ceiling).


Inverted mounting (door coils **below** the sill level).

Kinnear Rolling Doors save time, cut costs, save space, add protection, save manpower — *and fit any doorway or building construction!*

You get these multiple advantages from the coiling action of the interlocking steel-slat curtain *(originated by Kinnear).*

Kinnear Rolling Doors always open *out of the way* . . . keep all floor, wall and ceiling space *clear and usable* at all times . . . give extra *all-metal protection* against fire, theft, wind, weather, or vandalism.

Extra-heavy galvanizing (1.25 oz. pure zinc per sq. ft. of metal, ASTM standards) gives Kinnear Rolling Doors lasting resistance to corrosion. Built any size, of steel, aluminum, or other metals, with motor or manual operation, for old or new construction. Write for full information!

* Or a Kinnear Rolling Door and a Kinnear Rolling Grille (a coiling upward-acting "open-work" of steel bars and links that protects without blocking light, air or vision).

KINNEAR ROLLING DOORS
Saving Ways in Doorways

The KINNEAR Manufacturing Co.
Offices and Agents in All Principal Cities
FACTORIES: 1780-1800 Fields Ave., Columbus 16, Ohio; 1742 Yosemite Ave., San Francisco 24, Calif.

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WESTINGHOUSE PRODAC*
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MEANS
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AUTOMATIC DATA ACCUMULATION
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. . . keeps a permanent record of each foot of production . . . automatically registers all pertinent information and spots defect locations on the full production run. This is but one of the ways Westinghouse PRODAC† is now helping bring about the "mill of the future" today through completely automatic data accumulation systems.

Westinghouse has service-proven PRODAC installations that economically automate slabbing mills, blooming mills, reversing roughers, stock house materials handling and many other mill applications.

By specifying Westinghouse PRODAC for your mill, you open the door to many new cost-saving benefits which are unobtainable with conventional controls. For example, PRODAC assures the most consistent standards of quality control at the highest rates of production speed . . . coordinates operation of all machines at the over-all maximum efficiency . . . holds maintenance to a minimum, and practically eliminates control failures . . . gives you a "building block" design which provides flexibility required for future mill automation.

The entire team of Westinghouse PRODAC engineers is at your service to help you determine exactly where and how PRODAC can benefit you. Your Westinghouse sales engineer can give you complete information, or write Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa. J-22124

†Trade-Mark

*PROGRAMMED DIGITAL AUTOMATIC CONTROL

YOU CAN BE SURE...IF IT'S Westinghouse

WATCH "WESTINGHOUSE LUCILLE BALL-DESI ARNAZ SHOWS" CBS TV MONDAYS

Load Handling is Easy— Safe with COFFING

Quik Lift ELECTRIC HOISTS

It's easy for the operator to raise or lower loads while pulling a trolley mounted Coffing Quik-Lift Electric Hoist. The design of the pistol-grip control station and the combination strain and power cable makes this possible. The light but strong aluminum housing provides ease of portability. Changing voltages, limit switch, type of suspension or chain is quick because the housing is in sections.

For Safety the control station is made of non-conducting plastic in which the voltage is reduced to 115 volts and the push-buttons are mechanically interlocked. The V-type brake which provides maximum braking surface and positive control of loads is another safety feature.

For Efficiency in load handling specify Coffing Quik-Lift. Twenty models—capacities range from ¼ to 2 tons. Ask your distributor for details or write for Bulletin ADH-65.

DUFF-NORTON

- Pistol-Grip Push-Button Control
- Lightweight Aluminum Housing
- V-Type Brake for Maximum Braking Surface
- Easily Adjusted Limit Switch
- Complete Line of Accessories

Materials Handling Show Booths 2038 to 2042

RATCHET LEVER HOISTS

SAFETY HOOKS

CHAIN HOISTS

COFFING HOIST

DIVISION OF

DUFF-NORTON COMPANY

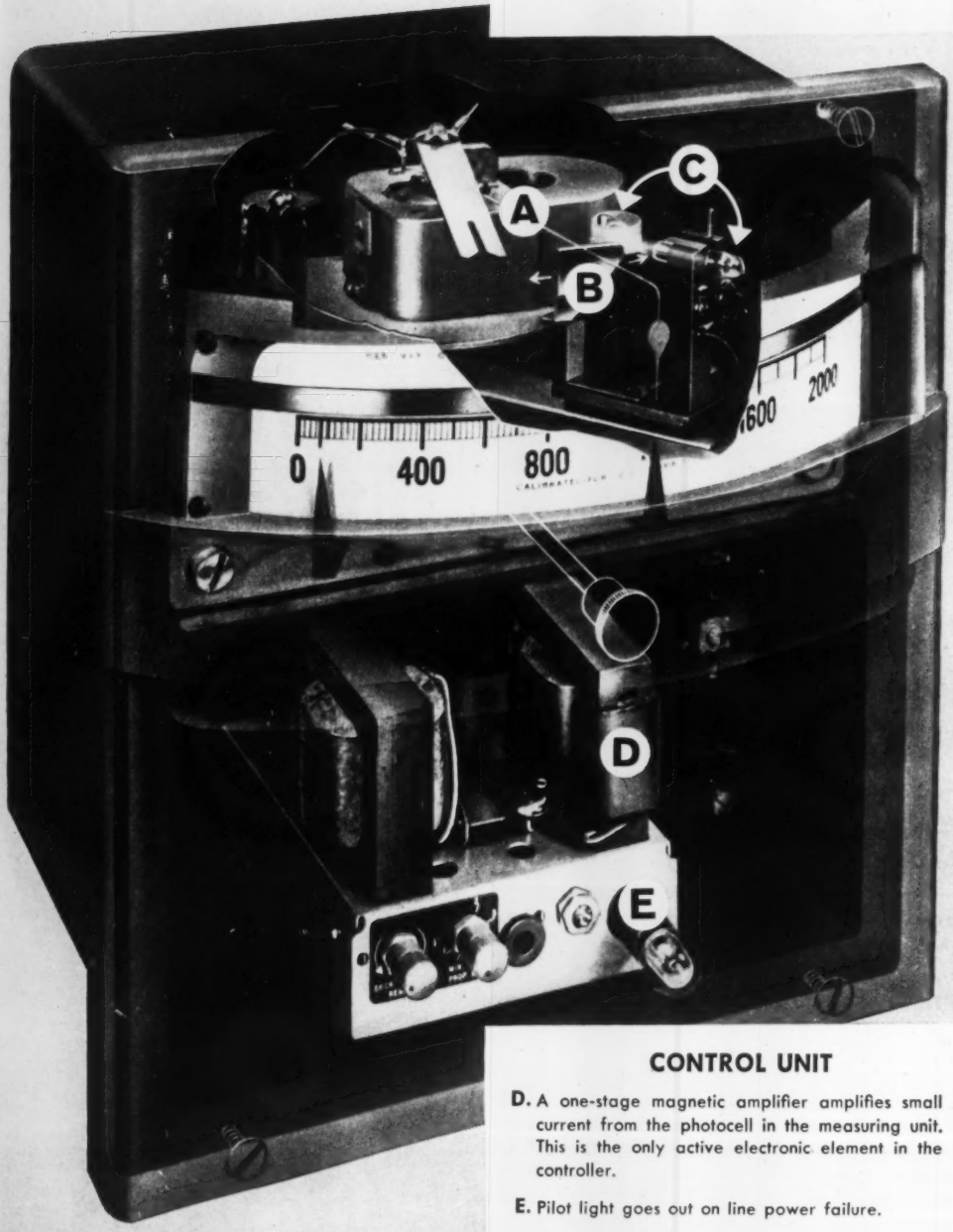
813 Walter Street • Danville, Illinois

MEASURING UNIT

A. A thermocouple signal to a d'Arsonval galvanometer, the only moving part, moves the indicating pointer up scale.

B. Aluminum vane adjusts the amount of light received by the photocell from the operating lamp.

C. If operating lamp or photocell fails, output voltage assumes a value equal to high temperature.

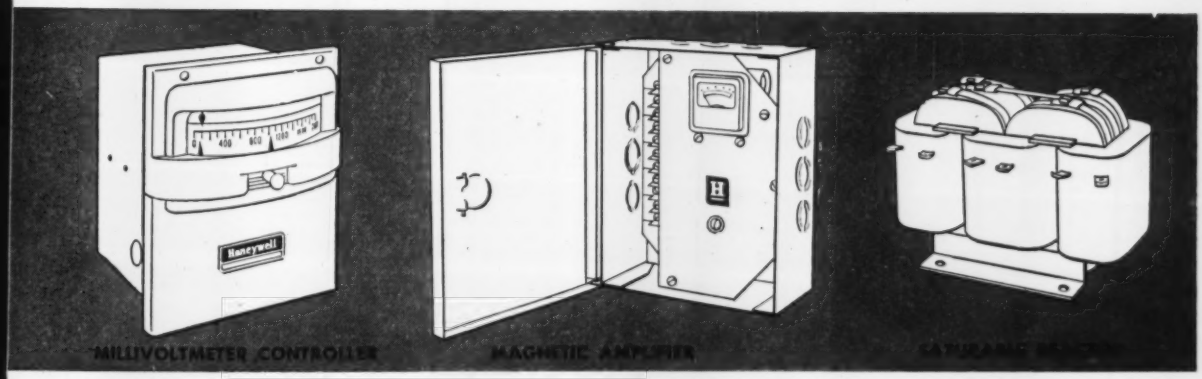


CONTROL UNIT

D. A one-stage magnetic amplifier amplifies small current from the photocell in the measuring unit. This is the only active electronic element in the controller.

E. Pilot light goes out on line power failure.

Pyr-O-Volt **controller is dependable and trouble-free. Built-in voltage regulator maintains voltage within ±1% of level required for maximum operating stability. Thermocouple burnout protection is optional. Spare operating lamp is supplied with all instruments. Available in both horizontal and vertical case models.**



For your electric heating applications...

Use this accurate, dependable *Pyr-O-Volt** controller

- **No tubes to wear out**
- **Voltage regulation**
- **Fail-safe design**
- **Contactless, stepless control**

Here's an accurate instrument for reliable stepless control of saturable reactors, r.f. generators and other power amplifiers. It has a proportional band adjustable from ⅔% to 5%, and a manual reset adjustment which shifts the control point over 100% of the proportional band.

The *Pyr-O-Volt* controller can control saturable core reactors up to 100 kva, if used with a Brown magnetic amplifier. You can also use this proportional output millivoltmeter-controller with the General Electric *Reactrol***, and with the Westinghouse *Furnatron*.*** Complete packaged systems available.

Contact your nearby Honeywell field engineer for complete details. He's as near as your phone.

MINNEAPOLIS-HONEYWELL, Wayne and Windrim Avenues, Philadelphia 44, Pa.

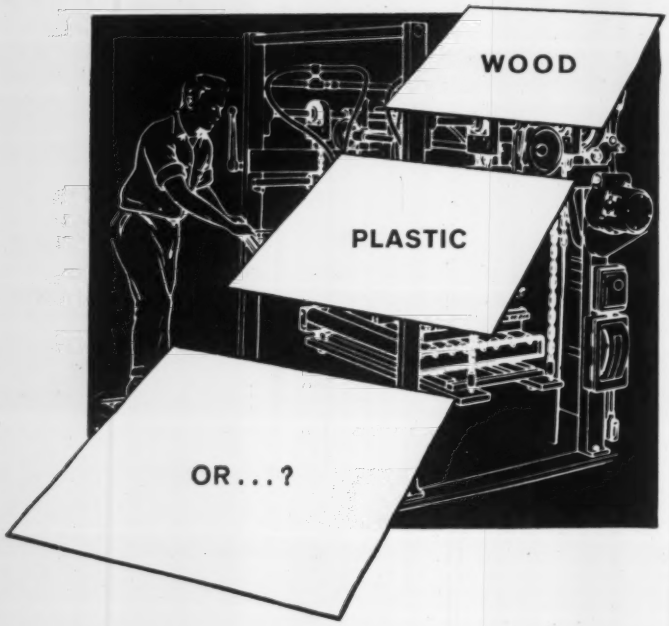
Honeywell

H HONEYWELL *First in Control*

● **REFERENCE DATA: Specification S103-5**

*Tradename, Minneapolis-Honeywell Regulator Co.
**Tradename, General Electric Co.
***Tradename, Westinghouse Electric Corp.

If You Feed Flat Sheets of . . . METAL



Increase Production Line Efficiency with
DEXTER AUTOMATIC FLAT SHEET FEEDERS

Hundreds of Dexter Flat Sheet Feeders are increasing production today in metal decorating plants, appliance firms, tin plate lines, and in stamping, slitting, cutting and trimming operations.

Dexter specializes in flat sheet feeding. There's probably a feeder to fit your requirements, for Dexter Automatic Flat Sheet Feeders handle all types of materials...metal, plastic, wood, masonite, glass and numerous others. They're built in over a hundred sizes, speeds, and load capacities ...sheet sizes range from 14 x 14 inches to 4 x 12 feet... thicknesses from .006 to ¼"...capacities from 6000 to 30,000 lbs....and speeds from 600 to 9000 per hour.

Investigate how Dexter Automatic Flat Sheet Feeders may improve your production efficiency. We'll be pleased to discuss your operation at no obligation, of course.

MIAD

THE DEXTER COMPANY
A DIVISION OF MIEHLE-GOSS-DEXTER, INC.
CHICAGO 8, ILLINOIS

Designers of a full line of sheet handling equipment since 1880

(*Concluded from Page* 83)

Inc., Long Beach, Calif.; second vice president, E. O. N. Williams, Bottled Gas Corp. of Virginia, Richmond, Va.; treasurer, W. S. Brenckle, Natural LP-Gas Corp., Waukesha, Wis.; secretary and assistant treasurer, Arthur C. Kreutzer, an association staff member, River Forest, Ill.

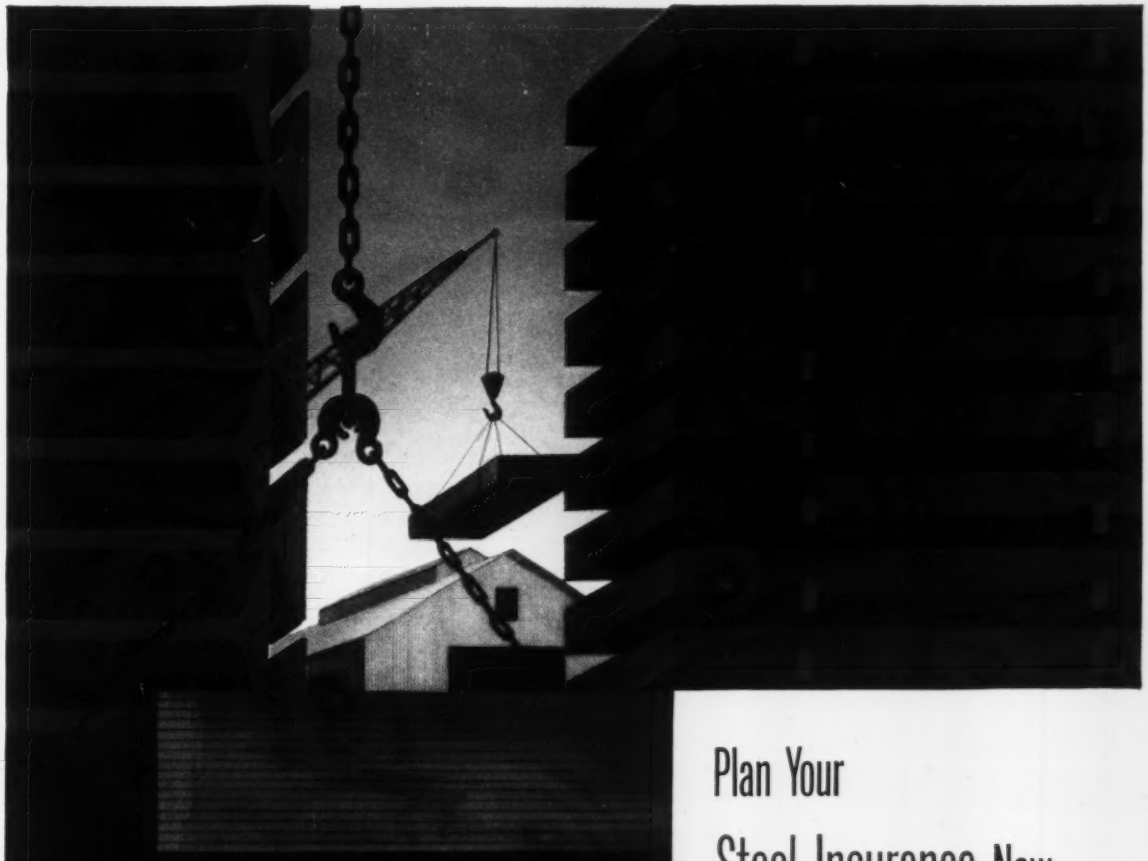
Scientific Apparatus Makers Association, Chicago, elected these officers: President, Dr. George A. Downsbrough, Boonton Radio Corp., Boonton, N. J.; president pro tempore, R. G. Halvorsen, Hamilton Mfg. Co., Two Rivers, Wis.; treasurer, T. M. Mints, E. H. Sargent & Co., Chicago. R. E. Welch, W. M. Welch Mfg. Co., Chicago, became director at large.

Industrial Diamond Association of America Inc., Pompton Plains, N. J., elected these officers: President, Donald J. Wallace, Wheel Trueing Tool Co., Detroit; first vice president, Bernard Jolis, U. S. Industrial Diamond Corp., New York; second vice president, Leopold H. Metzger, Super-Cut Inc., Chicago.

National Welding Supply Association, Philadelphia, has elected as its president A. C. Axtell, Essex Welding Equipment Co. Inc., Newark, N. J.

Welded Ring Manufacturers' Association, Pittsburgh, has elected A. S. Martin, King Fifth Wheel Co., Wilkes-Barre, Pa., president. Other officers: Vice president, F. J. Fabian, Dresser Mfg. Div., Dresser Industries Inc., Bradford, Pa.; treasurer, W. J. Sampson Jr., American Welding & Mfg. Co., Warren, Ohio. Hanson & Shea Inc. was renamed secretary of the association.

Air Conditioning & Refrigeration Institute, Washington, elected these officers: President, Rudolf G. Berg, Copeland Refrigeration Corp., Sidney, Ohio; vice presidents, Russell Gray, Carrier Corp., Syracuse, N. Y.; L. N. Hunter, National-U. S. Radiator Corp., Johnstown, Pa.; and R. K. Serfass, Air Conditioning Div., Westinghouse Electric Corp., Staunton, Va.; treasurer, W. H. Aubrey, Frick Co., Waynesboro, Pa.



Plan Your Steel Insurance Now

With steel supply tightening up again and the possibility of a real scarcity in the months to come, it's nice to have your orders for plain and fabricated steel in the hands of a reliable and well-supplied organization.

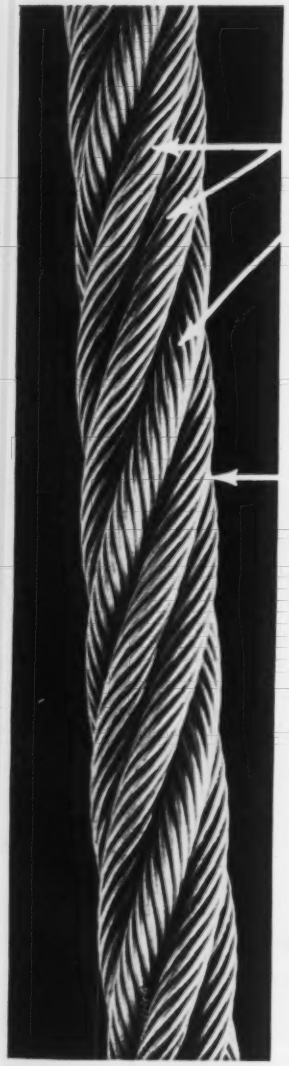
Steel buyers everywhere know Levinson's reputation for having steel on hand . . . and for "fabrication that fits."

just . . . Leave it to **LEVINSON**

Warehousers, fabricators, designers of steel for over half a century

the **LEVINSON STEEL COMPANY**

Pittsburgh 3, Pa.
Phone: HUbbard 1-3200



Herringbone's two pairs of Lang lay strands and one pair of regular lay strands provide the ideal combination of maximum flexibility with good stability.

Finer wires inside contribute to Herringbone's excellent drum-winding characteristics.

Heavier outside wires in each strand have greater resistance to abrasion.

"Herringbone* saves our equipment"

AMICO SAND AND GRAVEL COMPANY

Read this about the most exciting wire rope development in years . . . "Turning a profit on any product often boils down to something that will do a specific job better than anything else. Our equipment operators prefer Roebling Herringbone to any other for heavy lifts, clam shell, drag, pan work or dozers. The savings on sheaves, because of Herringbone's perfect tracking, are a big item as far as we are concerned."

Amico Sand and Gravel Company, Morrisville, Pennsylvania, and Riverside, New Jersey, has told you what this combined regular lay and Lang lay rope – two-ropes-in-one – is doing for them. Roebling is in a position to *show* you how the new Herringbone can, again, in the words of Amico ". . . give you a chance to turn more profit on production equipment." Write to Wire Rope Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey, for the full and fabulous facts.

*Reg. App. For

ROEBLING

Branch Offices in Principal Cities
Subsidiary of The Colorado Fuel and Iron Corporation

ROEBLING
HERRINGBONE
WIRE ROPE

Technical Outlook

June 1, 1959

GLASS PEENING—A liquid containing glass beads, plus air stream and a peening gun are used in what is termed a radically new way to peen metals. It improves fatigue life and produces 4 microinch finishes, says Aero-Test Equipment Co. Inc., Dallas.

REFRACTORIES LAST LONGER—Balanced ladle lining for hot metal cars will cut maintenance costs and downtime, says Refractories Div., H. K. Porter Company Inc., Pittsburgh. Using mullite bricks in extreme wear sections of the ladle (metal line, spouts, and belt area), an eastern steel mill poured 120,000 tons of hot metal before relining vs. 72,000 tons with an all clay lining.

GROWING IMPORTANCE OF ALUMINUM—The entire five-deck superstructure of England's newest luxury ship, the 40,000 ton *Oriana*, is welded aluminum. Vickers-Armstrong Ltd. claims it's the largest ever built on a ship. Ninety per cent was prefabricated.

EASIER MAGNESIUM WELDS— Zinc and rare earths make a new magnesium alloy (ZE10A) tougher and more weldable than previous formulas, says Brooks & Perkins Inc., Detroit. The sheet alloy doesn't require stress relief after welding.

OVENS LAST THROUGH LULLS— A new banking method helps coke ovens survive long work stoppages, says Great Lakes Steel Corp., Detroit. Ovens have been held longer than four months without apparent damage. They're filled with a nonoxidizing gas at about 1700° F and slightly above atmospheric pressure. A protective layer of carbon forms on oven lining bricks.

FENDS OFF FLUORIDE ATTACK— Containers made of Hastelloy N, a new formula, resists corrosive attack by fused salts containing fluorides. It was developed from work done at Oak Ridge National Laboratories by Haynes Stellite Co., a division of Union Carbide Corp., New York. The alloy can be forged, welded, investment cast, or extruded into a variety of shapes. Service temperatures vary between 1600 and 1900° F.

EXPLOSION PROTECTION— Detection - prevention systems are becoming more widely used in areas where extremely flammable materials are handled. The systems work so fast they start to suppress an explosion before a bullet entering one wall has time to pass out the other side.

BRICK OUTDOES METAL LINER—Prestressed brick is a superior lining in some corrosive applications, says Pennsalt Chemical Corp., Natrona, Pa. It's said to be cheaper than many clad metals when used as a lining for carbon steel vessels.

ZERO THERMAL EXPANSION—A machinable refractory of aluminum-lithium-silicate heated to 2000° F withstands a quenching in liquid air without cracking or spalling. It is chemically inert and comes in rods, tubes, discs, plates, and shapes, says Carborundum Co., Latrobe, Pa.

GIANT ROCKETS ON WAY—A $250,000 feasibility study for a rocket with a million lb of thrust is only the preliminary to rockets with thrusts up to 15 million lb, says Aerojet-General Corp., Azusa, Calif. Its goal: A 1000 lb payload.

HARDER CARBIDE-TO-STEEL BOND— A thin wafer of powder metal compound makes a 100,000 psi joint between carbide tips and steel shanks, says Powder Alloys Corp., Clifton, N. J. You need 500 psi, 2000° F, and 1 minute to complete the bond.

FOAMED, HI-TEMP INSULATION—Silicon carbide foams are corrosion resistant at 4000° F, says Carborundum Co., Niagara Falls, N. Y. Lightweight types weigh 30 lb per square foot and have a heat conductivity factor of 5.

Metalworking Outlook—Page 37 Market Outlook—Page 117

What's New in Material Handling

How Does Your Handling Rate?

To answer that question requires looking into a number of details. This checklist will help you. Every "yes" indicates an area where corrective action is needed.

1. Is you handling equipment more than ten years old?
2. Do you use a variety of makes and models which require a high spare part inventory?
3. Are equipment breakdowns the results of poor preventive maintenance?
4. Do your lift trucks have to go too far for servicing?
5. Do you have excessive employee accidents due to manual handling of materials?
6. Are materials weighing more than 50 lb handled manually?
7. Do you have any handling tasks that require two or more employees?
8. Are skilled employees wasting time handling materials?
9. Does material get jammed up at any point?
10. Is production work delayed due to poorly scheduled delivery and removal of materials?
11. Is high storage space being wasted?
12. Do you have high demurrage charges?
13. Is material being damaged during handling?
14. Do shop trucks operate empty more than 20 per cent of the time?
15. Do you have too many rehandling problems?
16. Is power equipment used on jobs that could be handled by some gravity method?
17. Are you using too many pieces of equipment because their scope of activity is confined?
18. Are many handling operations unnecessary?
19. Are single pieces being handled where unit loads could be used?
20. Are your floors and ramps dirty and in need of repair?
21. Is handling equipment being overloaded?
22. Is there unnecessary transfer of material from one container to another?
23. Are inadequate storage areas hampering efficient scheduling of movement?
24. Is it difficult to analyze your system because you do not have a detailed flow chart?
25. Are your indirect labor costs too high?

Material Handling Institute.

NEW DEVELOPMENTS in material handling equipment are aimed at increasing manufacturing productivity and lowering nonproductive costs.

Material handling involves motion, time, quantity, and space. All are costs. Equipment builders are seeking to reduce those costs by eliminating all unnecessary handling, move products faster and in heavier loads, and utilize space to its best advantage.

• **Most of the new developments are coming in the industrial truck and conveyor fields. Four trends stand out in the truck area:**

1. Trucks are becoming more compact to operate in confined areas.

2. They are being designed for more efficient operation and operator safety.

3. They are becoming easier to service and maintain.

4. Versatile attachments are being developed to make the lift truck an almost universal mover.

Make a personal survey of the lift truck manufacturers when you visit them in their booths at the Material Handling Institute Exposition in Cleveland next week. You'll be surprised at how many of them will have narrow aisle trucks on display.

Equipment builders know that aisle space is expensive because it takes away valuable storage space. In the shop, it means less space to carry on processing operations.

Several means are being used to make the trucks smaller without cutting load capacity. Raymond Corp.'s new 4000 lb electric truck gains a performance equal to large counterweighted units, says the company, through the use of heavy duty components in the drive unit assembly.

The unit has two drive motors directly coupled to large steerable wheels. Speed is controlled by varying the connection of the motors between series and parallel circuits

Attention will be focused on this important function next week at Cleveland during the Material Handling Show. Here are some of the coming trends. Checklist at left will help you gage the effectiveness of your system

to eliminate the power loss normally dissipated by resistors.

With counterweighted trucks, one approach has been to decrease the overhang at the front so the rear counterweight can be moved forward, decreasing over-all length.

• Ease of operation adds to the efficiency of a lift truck. The new drives being built into industrial trucks make them easier to operate, smoother in start-up and accelerations, and prevents jarring or jerking of the load.

Hyster Co.'s new Monotrol system allows the operator to control truck movements with one pedal. By pressing the left side of the pedal, the operator puts his truck in forward. By pressing the right side, he puts it in reverse. Further downward pressure accelerates the engine. Pushbutttons on the dash apply a parking brake, or put the truck in "drive."

Towmotor Corp.'s new Towmostatic drive eliminates many conventional lift truck components including transmission, drive line, differential, gearshift, and clutch assemblies.

The system uses hydraulic pumps and valves and a pair of piston-type hydraulic motors mounted independently on the drive axle. The drive provides immediate response to directional changes, without a time lag between pedal action and truck movement.

Frame rigidity is being increased on industrial trucks. It makes them more stable and safer to operate. On one model, the builder welds the truck frame and the outrigger into a single unit.

• Simpliciation of controls and fewer moving parts make maintenance easier.

In Yale & Towne Mfg. Co.'s Warehouser line, you can reach all parts that need servicing by opening a couple of doors. The operating components are built as packaged assemblies that can be replaced as a unit, and the faulty assembly repaired at a workbench. Example: It takes only 5 minutes to get the electrical contactor system out.

Clark Equipment Co. is introducing an electric rider-type straddle truck that's designed for easy maintenance. The drive unit can be removed from the truck while it is in an upright position. (Most trucks of this type must be tilted to the side for removal of the drive unit.)

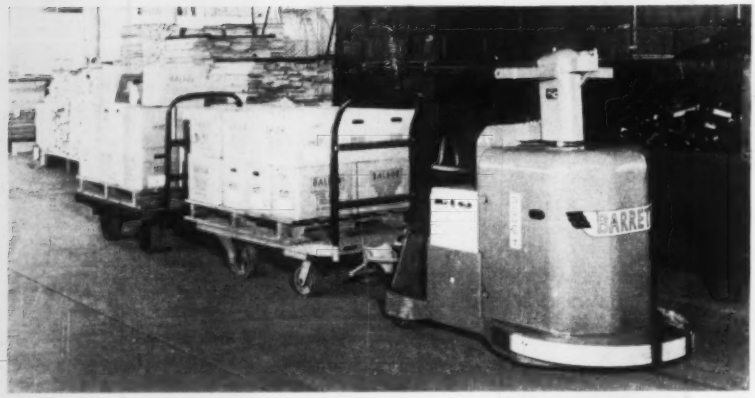
On Towmotor Corp.'s Pace-Maker series of heavy duty fork lift trucks, all engine compartment side panels are slip-socketed for easy removal without tools in less than 30 seconds. The open area provided by an easily removable engine cover brings all components within full view and easy reach for fast servicing and maintenance.

• Attachments for lift trucks that were experimental a few years ago are available.

Manufacturers want to handle products without the use of pallets. To meet the demand, builders have developed such versatile truck attachments as drum handlers, coil hooks, carton grabs, strip and coil steel upenders, and dumping devices.

Yale & Towne Mfg. Co. will show a new vacuum cup lifting and carrying attachment for handling products packaged in cardboard boxes. The vacuum cups are mounted on a vertical plate that's attached to the lift carriage. To handle a box, the truck operator simply runs up against it, turns on his vacuum, and then he can lift it, carry it, stack

With the vacuum cup attachment made by Yale & Towne Mfg. Co., the truck operator can run up to a load, turn on his vacuum, then lift it, carry it, or stack it



The Barrett-Cravens Guide-O-Matic tractor can be tape controlled to carry out repetitive operations like starting, stopping, and uncoupling trailer cars

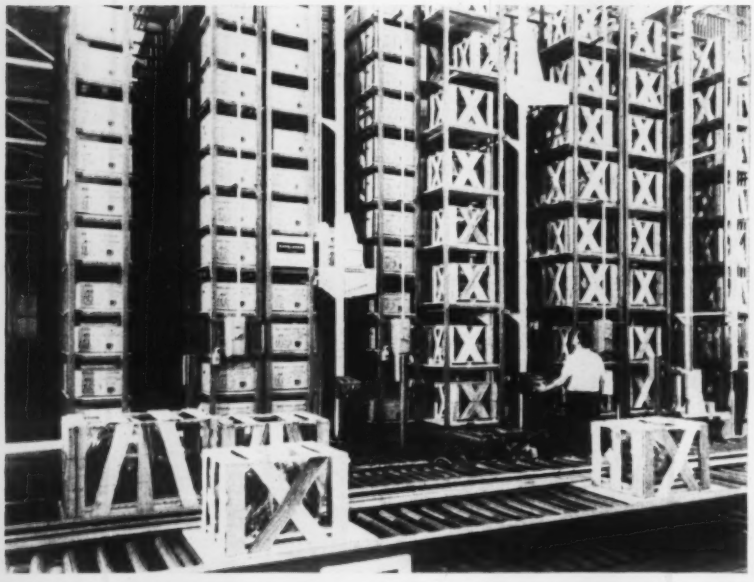
it, or set it down. The absence of forks gives the truck a greater turning radius.

With handling attachments, the lift truck becomes a special purpose vehicle. Many truck builders are designing the carriages so attachments can be interchanged quickly and easily.

• Here are some stoppers you'll see at the show.

A side loading truck that can lift loads above 18 ft will be introduced. The manufacturer, Yale & Towne Mfg. Co., believes the side loading principle is the only way to handle loads at great heights. The model to be shown will carry 3000 lb. It can operate in an aisle no wider than the truck itself since it normally carries its load within its own width.

Another innovation, again by Yale & Towne, is a truck with a lifting speed of better than 130 fpm. Lifting and lowering of a load are usually a sit-and-wait situation. The faster you can get the load onto and off the forks, the greater the efficiency of the truck.



The two-way Retriever system at Triax Equipment, Cleveland, delivers loads to or from any of 4800 storage compartments at an average rate of one load a minute

Probably the biggest truck to be shown this year will be Clark Equipment Co.'s new stacking carrier. It will carry 50,000 lb. It has a U-shaped frame and lifts through the arch.

The carrier was developed to carry and stack shipping vans used by ocean-going ships. The vans are 17 to 24 ft long, 8 ft wide, and 8 to 8½ ft high. The carrier can stack the vans two high.

Barrett-Cravens Co. is programing its Guide-O-Matic tractor, the truck that pulls trailer trains through a plant without an operator. Repetitive operations like uncoupling, starting, and stopping, can be put on tape and transmitted to the tractor.

Another control system for the Guide-O-Matic, called Radox, lets a dispatcher control the operation of the trailer trains with a transmitter he wears on his belt.

• Emphasis on continuous flow of materials in process is strong, especially in larger plants.

Manufacturers of engineered conveying systems are building equipment to handle materials faster and in greater volume. The faster the processing machines are operated, the more automatic features must be used on conveyors to maintain uninterrupted flow.

In industries where conveyors have long been used, such as the automotive and household utilities fields, greater use is being made of automatic loading and unloading. Automatic dispatching and pushbutton warehousing are being used in the storage of parts and feeding of parts to assembly lines.

A push-key storage handling system delivering loads as heavy as 3500 lb to or from any of 4800 storage compartments at the average rate of one load a minute is in use at Triax Equipment, Cleveland. The Retriever system transports the loads to or from a central loading dock at the touch of selective electrical controls and requires less than half the floor area used by conventional storage methods, says George R. Johnson, general manager of the company.

While there is less emphasis on automatic control in smaller metalworking plants, mechanized handling is getting attention.

Conveyors are being made in

prefabricated segments so they can be modified when production requirements change. You can add, take away, or move to suit new needs.

Power and free conveyors are becoming more popular. One of the reasons is their usefulness for live storage. You can accumulate stock easily on the free conveyor track.

Automatic memory devices are possible on the power and free conveyor. They may be mechanical, magnetic, electronic, punched cards, or tape. A new system to be introduced by the Conveyor Div. of Columbus McKinnon Chain Corp. has a route selector dispatch head that can be attached to each carrier. The two route selector dials on the head can be set to automatically guide the carrier to any station in the system.

More attachments for package conveyors are becoming available. Memory devices remember sequences of operation. Sensing elements read or detect labels on boxes, and cause them to be pushed off the conveyor at the right place. Counter attachments count the packages and push off every fifth, tenth, or other selected package.

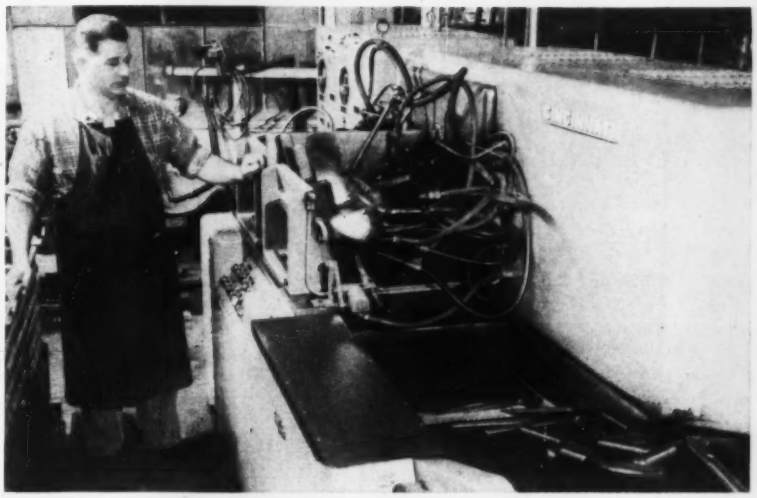
Crane manufacturers are tailoring their designs to take advantage of advances in electronics and metallurgy. Faster speeds, greater capacities, and more exact control are coming.

Several electrical manufacturers have developed and announced improved crane controls. Example: Hoist motor controls that cause the motor to produce the required torque and speed without electrical or mechanical retarding brakes.

• Like the builders of processing machines, the material handling equipment manufacturer is continually upgrading his product to keep pace with advancing technology.

"We can build you an automatic warehouse today, if you are willing to pay for it," explains L. West Shea, managing director of the Material Handling Institute. Although it isn't yet economically practical, it soon may be through the pressure of necessity.

• An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.



Right oil in this Cincinnati Flamatic gives maximum case penetration and slow cooling in the distortion range. Tooth sections of hook jaws are being hardened

Case Hardening Aided by Fast Quench, Slow Cooling

FAST initial quenching and slow cooling offer several case hardening advantages.

Such quenching assures deep, uniform hardening in steels lean in alloy content and in steels having small grain size or wide variation in grain size.

Such cooling through the critical distortion range assures minimum distortion in high hardenability steels or in parts having variable sections or odd shapes.

At Ridge Tool Co., Elyria, Ohio, heat treaters are getting both benefits with the careful selection of a quenching oil. In this case it's Gulf Super-Quench.

• The heat treat foreman discovered the value of the right quenching medium when heavy production of cutter screws increased a case hardening load to 500 lb.

Depth requirements of the C-1117 steel were 0.008 to 0.010 in. by carbonitriding.

Previously, the capacity of the Lindberg, No. 3, controlled atmosphere furnace had been rated at only 300 lb per hour.

The heavy load was soaked 2½ hours at 1550° F, then quenched for 30 minutes.

• The payoff: Consistent superficial hardness readings of 15N90-92 and uniform core readings of 35-38 Rockwell C—both well within requirements for the piece.

The 500 lb load was unusual, says the company, although present loads average well above the old maximum, with 400 lb being tops at the present time.

Another case for the right quenching oil is the workholder for a threader made by Ridge Tool. A 0.005 in. penetration of case is done by soaking for 30 minutes at 1400° F and quenching for 25 minutes at 180 to 200° F in the 600 gallon integral quench bath.

A typical job is the selective hardening of tooth sections of hook jaws for the company's pipe wrenches. Gears for power machines which drive pipe threaders are also selectively hardened. Distortion of gears with big bores is a negligible factor because of the quenching oil's cooling range efficiency.

Thicker Coatings Add New Dimension To Markets for Vacuum Metallizers

New technique deposits up to 0.004 in. of aluminum or cadmium on a wide variety of metals. Coating is tough, ductile, and resists corrosion. It can be anodized, colored, buffed

Philip J. Clough, National Research Corp., examines aluminum-coated bumper on his sports car. It withstood a Boston winter with no sign of pinholes or corrosion

A NEW vacuum metallizing process makes it possible to deposit 0.004 in. coatings of aluminum or cadmium on steel or aluminum parts.

National Research Corp., Cambridge, Mass. (the developer), lists these benefits:

The deposits are strong, ductile, nonporous.

They do not affect tensile strength of the base metal (substrate).

Corrosion resistance is the same as that of solid aluminum or cadmium.

Cost: Around 10 cents a square foot for large volume parts like automobile grilles.

• **The development is an extension of conventional vacuum metallizing.** Current systems develop films perhaps a few millionths of an inch

APPLICATIONS

Auto trim, household appliance parts, aircraft fasteners, marine hardware, bottle caps, ordnance equipment

NRC Vice Presidents Fred Greene Jr. and Robert Stauffer display steel hubcap with a buffed aluminum coating. Auto firms are testing method

thick—enough for decorative purposes but inadequate for corrosion resistance.

The NRC process permits films several thousandths thick which not only resist weathering but can take various chemical surface treatments. Aluminum, for example, can be anodized and colored, a plus feature for automotive trim.

• A growing range of metals is being treated.

NRC says it has coated high tensile, cold and hot rolled steels, aluminum diecastings and forgings, and titanium. Research is directed toward aluminum alloy castings, and forgings, and magnesium. Evidence indicates even broader horizons.

• Parts can be metallized several ways.

Batch metallizing is used for single objects. A rack in the metallizing chamber revolves around a heated container of metal (usually aluminum). Parts are coated by vapor deposits.

Semicontinuous methods are used for strip. Rolled metal is put on a shaft. It is unrolled rather quickly over the heated aluminum.

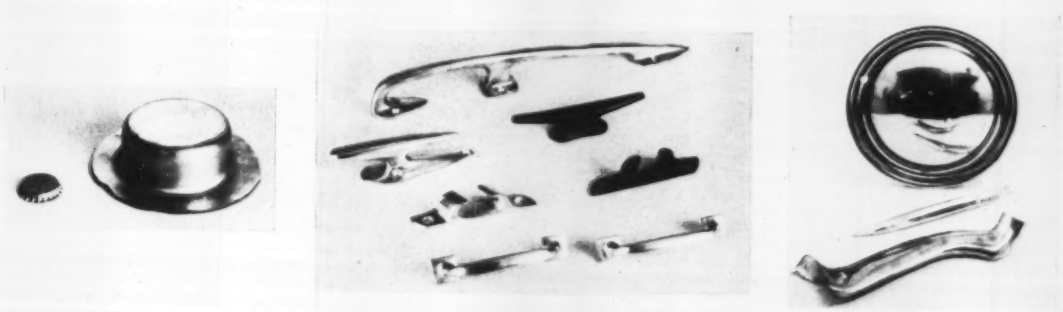
You can also metallize continuously. A strip of metal passes through two vacuum seals entering and leaving the metallizing chamber. Deposits are made as the strip passes the heated metal source.

Several kinds of aluminum "sources" are available, says NRC, but the one most commonly supplied under license is heated to about 1850° F.

• Market possibilities have been studied for use by licensees.

Preliminary market analysis shows potential in three areas: Aircraft and missile high tensile steel parts; metallized steel strip; corrosion protection of mild steel parts like bolts, nuts, and washers, and automotive steel and aluminum shapes.

NRC says it believes the process is ready for exploitation. It will arrange to license the process. First public showing is scheduled for June 15 at the American Electroplaters Society meeting in Detroit.



Bottle cap (left) is pink; 1¼ in. draw illustrates coating ductility; center pieces are aluminum diecastings (dark parts dyed blue); auto parts (right) are pale gold and blue aluminum

Material Handling Sessions Announced by Three Societies

BREAKTHROUGH is the theme for the technical sessions sponsored by American Material Handling Society Inc. next week in Cleveland. The American Society of Mechanical Engineers and Society for Advancement of Management are co-operating with AMHS to present the three day program.

The sessions will be devoted to ways of breaking through industrial material handling costs, including the management, engineering, and application phases. One morning will be given to each phase.

Sessions run from 9 a.m. to 12:15 p.m., June 9, 10, and 11 in Cleveland's Public Auditorium.

The Material Handling Institute's Exposition (June 9 through 12) will be at the auditorium. About 240 exhibitors will show $5 million worth of equipment in 40 major categories. An interpreting service will be available for foreign visitors.

Cleveland's Public Auditorium will house all exhibits. Exposition hours: June 9, 10, and 11, from 10 a.m. to 5 p.m.; June 12, from 10 a.m. to 4 p.m. Technical sessions will be in the auditorium from 9 a.m. to 12:15 p.m., June 9, 10, and 11.

Tuesday, June 9, 9 a.m.
Society for Advancement of Management

• **Chairmen**—Warren King, manager of features and departments, *Factory*, and SAM national vice president for material handling. Roy Rix, senior consultant, Cost & Methods Dept., Cleveland Electric Illuminating Co.

• **Speaker**—Fred E. Harrell, general manager, Marquette Div., Curtiss-Wright Corp., and SAM national treasurer: "How to Sell Me on Material Handling."

• **Panel**—Charles A. Thomas, assistant secretary, Standard Pressed Steel Co.: "The Type of Individual Best Suited to Carry Out Material Handling and Packaging Activities." Jonathan L. Collens, manager, Large Motor Div., Reliance Electric & Engineering Co.: "What Should the Material Handling Man Know About Business Economics?" Roland W. Puder, group supervisor, E. I. du Pont de Nemours & Co.: "How Do You Pay for New Equipment . . . . Lease, Rent, or Purchase?"

Wednesday, June 10, 9 a.m.
American Society of Mechanical Engineers

• **Chairman**—A. T. Gaudreau, Gaud-Reau Associates.

• **Panel**—M. A. Michel, assistant chief engineer, Pittsburgh & Lake Erie Railroad: "Mechanized Freight Handling at Railroad Terminals." Carroll Boyce, editor, *Fleet Owner*: "Integrating the Outbound Carrier into the Production Line."

• **Chairman**—Prof. Byron Saunders, College of Engineering, Cornell University.

• **Panel**—John Moskowitz, engineer in charge of material handling, Philadelphia Electric Co.: "Coal Handling Facilities at a Power Generating Station." George E. Waldron, production manager, Carling Brewing Co.: "An Engineered Case Handling System in a Modernized Brewery."

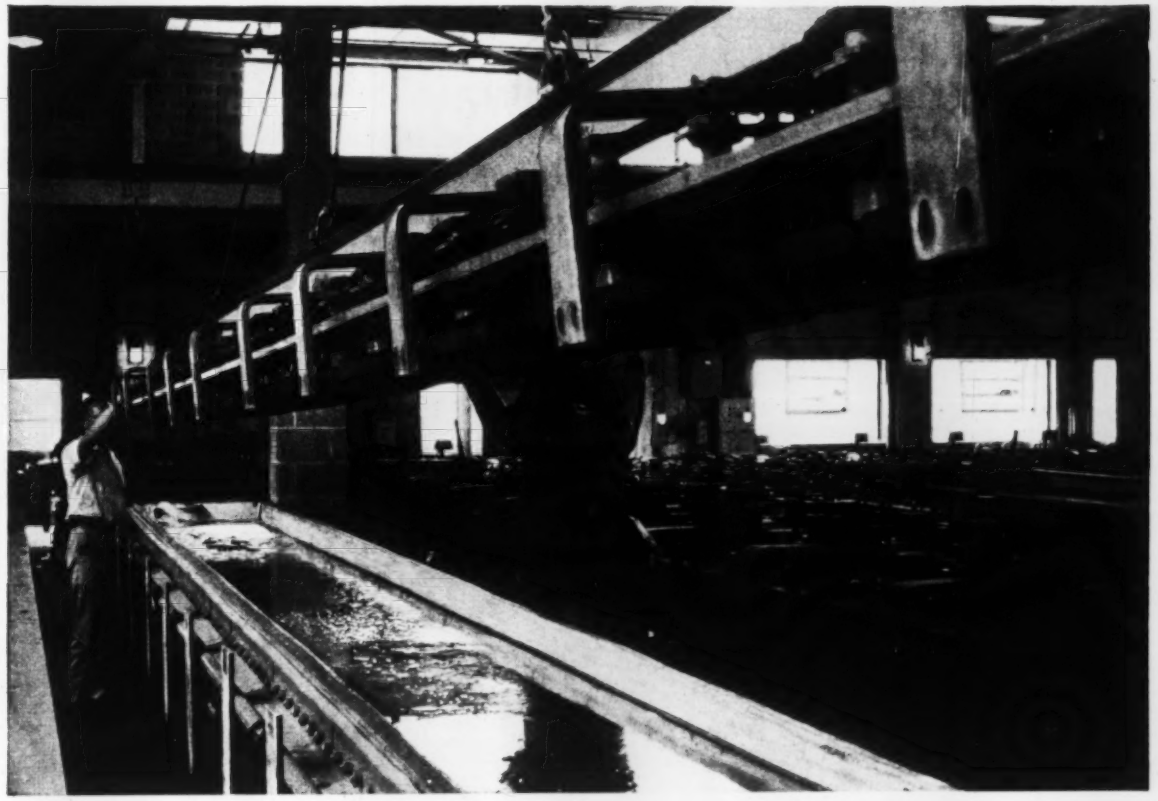
Thursday, June 11, 9 a.m.
American Material Handling Society Inc.

• **Chairmen**—Joseph F. Carle, vice president, Lincoln Extension Institute Inc., and Ralph Riener, product manager, concrete products, Cleveland Builders Supply Co.

• **Speaker**—Norman Schaffer, material handling engineer, Western Electric Co.: "How to Get Personnel to Accept New Ideas in Material Handling."

• **Panel**—Myron Miller, supervisor of safety, Westinghouse Electric Corp., and regional vice president of American Society of Safety Engineers: "Safety Training for Material Handling Personnel." Jack Vander Molen, Crane Co.: "How Can Material Handling Solve Production Problems?"; Thomas Wharton, Container Laboratories Inc.: "What the Material Handling Engineer Should Know About Packaging."

PERMOBOND LININGS



252 metal cells are resistant to chlorine and chlorinated salt solutions

This plant of Olin Mathieson Chemical Corporation at McIntosh, Alabama, produces hundreds of tons of chlorine daily. Because chlorine and chlorine salt solutions destroy metal in a matter of hours, the 252 carbon steel cells used here are protected with U. S. Permobond® Linings S5471. This is a special compound of Permobond Linings that has been successfully used by producers of chlorine for the past several years to protect the metal parts in electrolytic amalgam cells. This Permobond S5471 is the *right* lining for all chemical processors using this highly corrosive basic chemical.

Any original equipment can be lined with Permobond before delivery. You can also have it put on existing equipment—*right in your own plant.*

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Permobond cannot be compared with any other tank lining. That's why so many major corporations in basic chemical manufacturing, chemical processors, and steel pickling plants have their equipment lined with it. Fast, dependable service is available to you at local sources. Contact us at address below.

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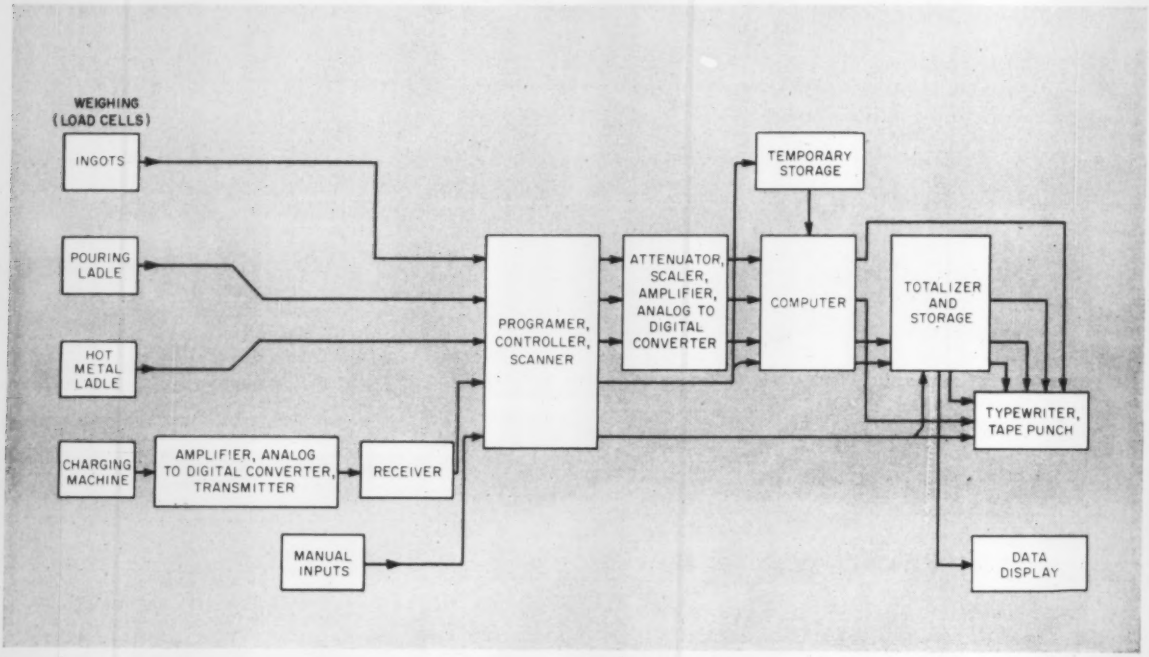
Automation of Open Hearth Expected to Gain Headway

By J. E. ORAM
Industrial Engineering Section
General Electric Co.
Schenectady, N. Y.



Weighing and data logging system would furnish process information for immediate use and help in the development of an open hearth computer-controller

Data logging is a logical start toward automatic charge and process control. Recorded information would be used to increase steel production and improve quality. Here's some information data loggers would record:

- **Weight and composition of charge material.**
- **Analysis and time of slag samples.**
- **Ladle skull weight.**
- **Type and quantity of ladle additions.**
- **Weight and analysis of the heat.**
- **Ingot weights.**

YOU'LL see increasing use of automatic control systems for open hearth furnaces. Result: Greater efficiency and sizable cost savings.

Steelmakers are intrigued with any efficiency boost, even though small, because open hearths account for a major percentage of the nation's steel output.

Most of the needed control technology is available; it should be applied wherever it's practical.

• Current automation techniques can be adapted to open hearth furnace control.

Automatic operation of open hearths has been slow to come. Needed: Better understanding of complex process reactions, high speed data collection techniques, and better control technology.

Programing and control methods are available for an automatic furnace control system, but they must be adapted to open hearth operation. First step: Collect data needed for a process correlation study, to define controlling equations. Large quantities of data must be collected and studied, because of the many variables, some not fully understood.

Helping an IDEA*

Become a Reality . . .

Photos, Courtesy
Rockford Metal Products, Inc.,
Rockford, and
John Oster Manufacturing Co.,
Milwaukee

How Close Collaboration Between Manufacturer and Supplier Develops a Superior Stainless Steel Part at Lower Cost

When Rockford Metal Products engineers developed the idea of a one-piece diaphragm housing for the John Oster "Osterizer," they called on Chicago Steel Service for assistance.

Two problems confronted the manufacturer. Special dies had to be developed to handle the series of severe draws required. Also, the part called for a type of stainless steel tailored to this specific job.

Metallurgists at The House of Stainless went to work on both problems. They helped in the step-by-step development of the dies and fabricating processes. Then, after exhaustive tests, they came up with a type of stainless steel with specially-controlled temper and finish capable of meeting the rigid specifications. As a result, the one-piece diaphragm housing is being supplied successfully today and at lower cost per unit.

This kind of close collaboration is the rule at Chicago Steel Service, rather than the exception. Let us help you explore the plus advantages of stainless steel for your production without cost or obligation on your part. This service is backed by prompt deliveries from our complete warehouse stocks or through direct mill shipments.

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YOUR DEPENDABLE SOURCE FOR BOTH CARBON AND STAINLESS STEEL

• Data logging would furnish information for immediate use and help develop additional automatic controls.

Information would be collected in a form adaptable to machine processing. It would be used in process correlation studies to establish controlling equations and close process control loops.

A typical open hearth data logging system would record weight, type, and composition of charge materials, and other process information. Data would be recorded in typewritten form for production use and on punched tape for process correlation studies.

Some of the required sensing devices aren't available. Some data would have to be applied manually. Equipment would be built flexibly to accommodate sensors as they're developed.

Charging machines don't lend themselves easily to completely automatic charging. That makes modern programing methods impractical at present. But the suggested system does include partial programing. Preset weight selectors and a program selection board could be used by the first helper to control quantity and sequence of charge materials. The system would provide instructions, at the appropriate time, for charging machine and hot metal crane operators.

Open hearth practices should be studied for possible automatic charging techniques. New material handling methods, compatible with open hearth design and practices, might include automatic conveying and weighing, or individual weigh hoppers at the furnaces.

• Automatic charge control should reduce product cost and improve quality.

Accurate records of materials charged into the furnace should cut average heat time, minimizing or eliminating additions of hot metal late in the heat to produce required tonnage. It should also make furnace operation more predictable.

Better quality control should be possible with more complete charging records. Programing and visual monitoring should increase charging efficiency. Pouring of ingots to exact weight should reduce crop at the bloom or slab shear, increasing yield.

• Better technology and economic pressure may speed development of an automatic charge computer.

A computer that could compute a chemically correct charge should increase uniformity and predictability of the product. Knowing the chemical analysis of available raw materials and hot metal, and knowing what scrap is available, it should be possible to compute the right proportions of materials to be charged. The computer would provide charging instructions, or even automatic programing.

The same computer may eventually receive process signals (such as slag and bath analysis, or bath temperature), and compute the bath additions needed to hold the refining process on course.

Some steelmakers feel they can develop equations describing a chemically correct charge in the near future. Computation may require simultaneous solution of several equations, to obtain the right quantity and quality of slag, correct bath analysis, or other factors not yet known. Raw material analysis techniques must also be developed. Interest is being shown in x-ray spectrometry and diffraction methods.

Switch to Castings Ups Quality, Trims Cost

Higher quality and lower costs were realized by making a chain pipe vise assembly from malleable castings.

Savings on the base came to 18 cents. The cast unit takes the place of two separate jaws and a base plate.

Two milling, one broaching, and one peening operation have been replaced with milling of the vise teeth.

Compared with the previous product, the base is more rigid, and flame hardened jaws provide a much tougher tooth surface.

Changing the chain tightening nut to a casting saved 7 cents. Machining was reduced to a single tapping operation.

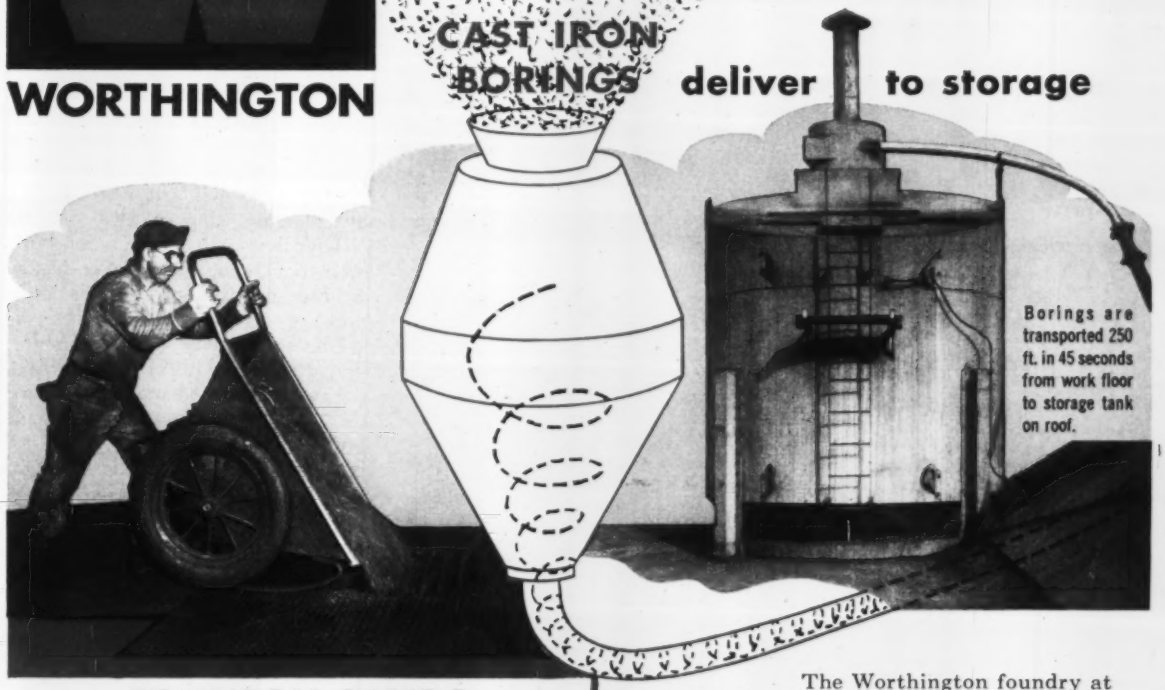
Improvement in appearance with no cost increase resulted when the handle was made as a malleable casting.

The assembly is cast by Milwaukee Malleable & Grey Iron Works for Milwaukee Tool & Equipment Co., both of Milwaukee.

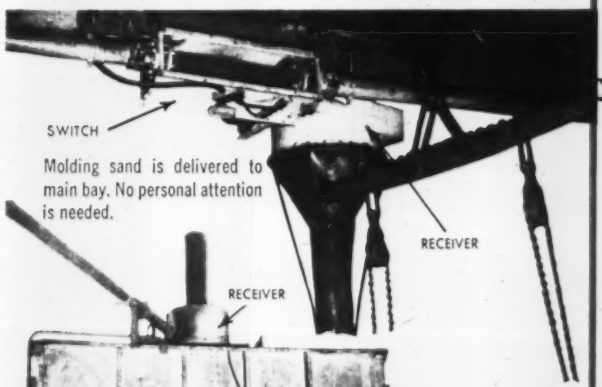
SPEEDING PRODUCTION OF CRANKCASES for radial aircraft engines, this machine, developed by Zagar Inc., Cleveland, uses gearless tool heads for closer hole spacing and greater accuracy. It drills, reams, taps, and back counterbores all mounting stud holes for a bank of cylinders in one pass

WORTHINGTON cuts handling cost ½

CAST IRON BORINGS deliver to storage



FOUNDRY SANDS DELIVER TO 4 STATIONS



Illustrated switch allows sand to be supplied to large molding hopper in the far end of plant. Note: conveyor tube can be routed under crane runway. No need for catwalk or extra supporting structure.

The Worthington foundry at Oil City, Pennsylvania transports borings to a storage tank located on the roof with minimum labor and maintenance costs. Borings are gathered and dumped through floor grating to transporter. No other handling is involved. Foundry sands are delivered to anyone of 4 stations as needed by the use of Whirl Air Flow transfer switches that direct sand flow through overhead tubes. Production delays caused by sand shortage has been entirely eliminated at the Worthington foundry since Whirl Air Flow was installed.

Maintenance work on the system is negligible and most important, direct material handling costs are reduced by ½ at this Worthington foundry. Cost of installing Whirl Air Flow is much lower than you would imagine. Just let us estimate a Whirl Air Flow system to fit your foundry need.

***WRITE TODAY**—an engineer will show you how a Whirl Air Flow system will save you money.*

WHIRL AIR FLOW PNEUMATIC CONVEYORS

WHIRL-AIR-FLOW

[illegible] Minneapolis 14, Minnesota • [illegible]

With this new fixed pressure regulator, different flow rate selection is made by changing adapters. This eliminates improper adjustment and waste. The unit shown above is a two stage type and can feed one or two arcs different rates of flow. Two adapters and the regulator are shown in the inset

New Inert Gas Regulator Helps Operators Save

- It provides a steady, accurate flow for welding jobs where flow rate requirements don't change.
- Improper flow adjustments are eliminated.
- Different flows can only be obtained by changing adapters.
- Each station on manifold systems can feed different flow rates.

YOU can cut inert welding gas consumption as much as 50 per cent, says Air Reduction Sales Co., Union, N. J., a division of Air Reduction Co. Inc.

Here's how: Furnish your operators with regulators that will deliver the correct fixed flow for the job.

• Adjustment of the gas flow rate determines gas consumption.

If the job does not require frequent changes in flow rate, a fixed flow adapter can be used, says the company. It is offering a new line of fixed flow regulators.

• Prior to the development, it was easy for the operator to improperly adjust the flow rate.

Some operators miscalculate and others find it easier to work with high gas flows.

Flow can be closely controlled by adapters which are screwed into the three types of fixed pressure regulators. The adapters are filtered, interchangeable orifices, calibrated to provide a steady, accurate flow.

• Different flows can be obtained by changing adapters.

The flow will remain constant even though the electrode holder or welding gun is changed or its back pressure varies.

The single stage regulator is designed for use with one arc. With the two stage, fixed pressure regulator, two adapters can feed different flow rates from one regulator to separate arcs that can be worked independently.

The B station valve is particularly well suited for pipeline manifold systems. Each station can be equipped with a flow adapter geared to its operation without interfering with any other station. It's ideal for production jobs where the required flow rates don't change daily. B station valves and flow adapters are compatible with any pipeline system, says the company.

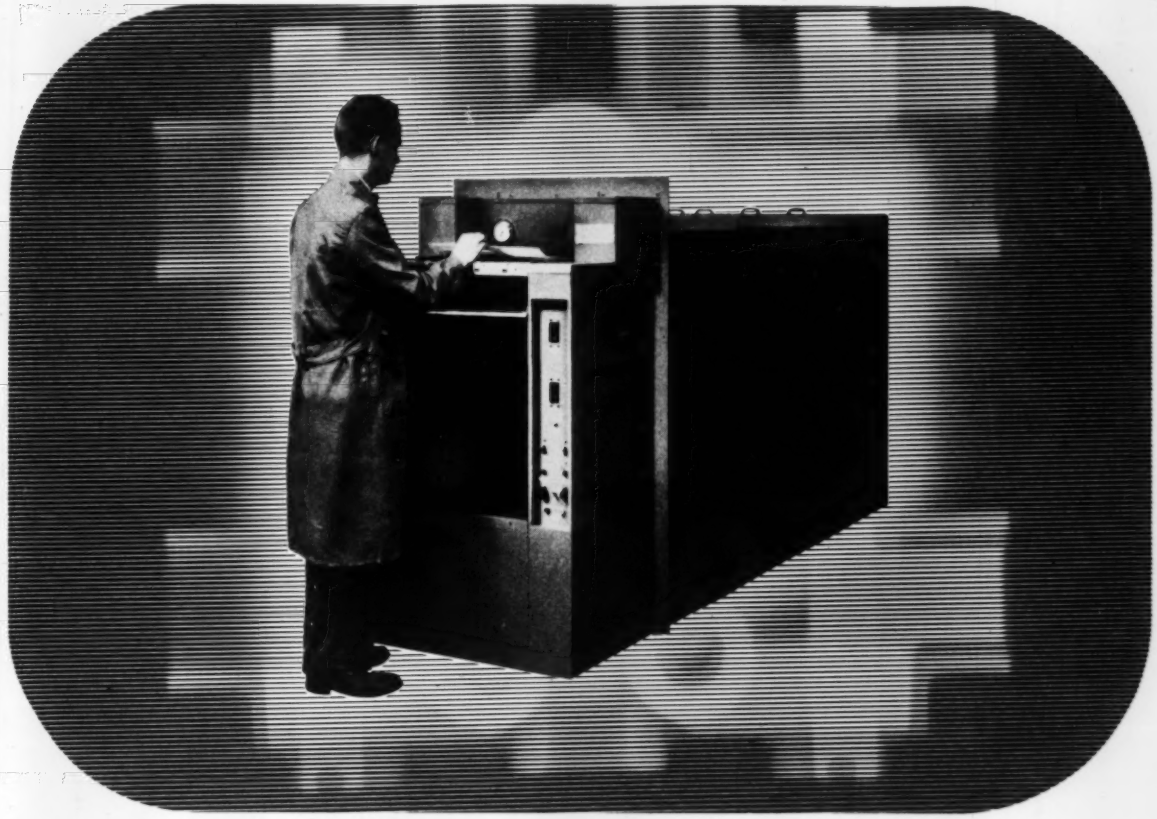
Minimum flow rate depends upon conditions such as drafts, current level, gas used, and nozzle-to-work distance.

• Here's a procedure that can be used to determine the minimum flow rate for a job.

Reduce the gas flow gradually while welding and use a flowmeter regulator to measure the flow. When the surface of the puddle begins to discolor, slowly increase the flow until the puddle again becomes clear. This is the minimum allowable flow.

If machine welding is being done, a flow about 10 per cent higher than the minimum figure should be used, says Air Reduction. Figure about a 15 per cent higher flow for manual operations. Generally, the higher the current, the higher the flow required. Tungsten electrode welding takes less than the consumable electrode method.

Quality control tests must be considered when determining minimum flow requirements.



13-minute industrial x-ray film processing

New Kodak Industrial X-Omat Processor can save you time and money

Kodak offers you automation in film processing—radiographs of uniform high quality, dry and ready to read in 13 minutes.

Film hangers are eliminated. Exposed films are merely removed from the film exposure holders and fed directly into the processor. Kodak Industrial X-ray Film, Type AA and Type M—sheet films or continuous lengths from 70mm to 17 inches wide—go through the system at 38 inches per minute. *And* only 22 inches of the unit's 10-foot 10-inch length need extend into the darkroom itself.

The Kodak X-Omat Processing System saves time and cuts costs. You'll want the complete story.

Send for the folder that gives all the details.

X-ray Division—EASTMAN KODAK COMPANY—Rochester 4, N.Y.

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☐ Send the folder about the Kodak Industrial X-Omat Processor.

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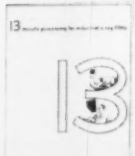
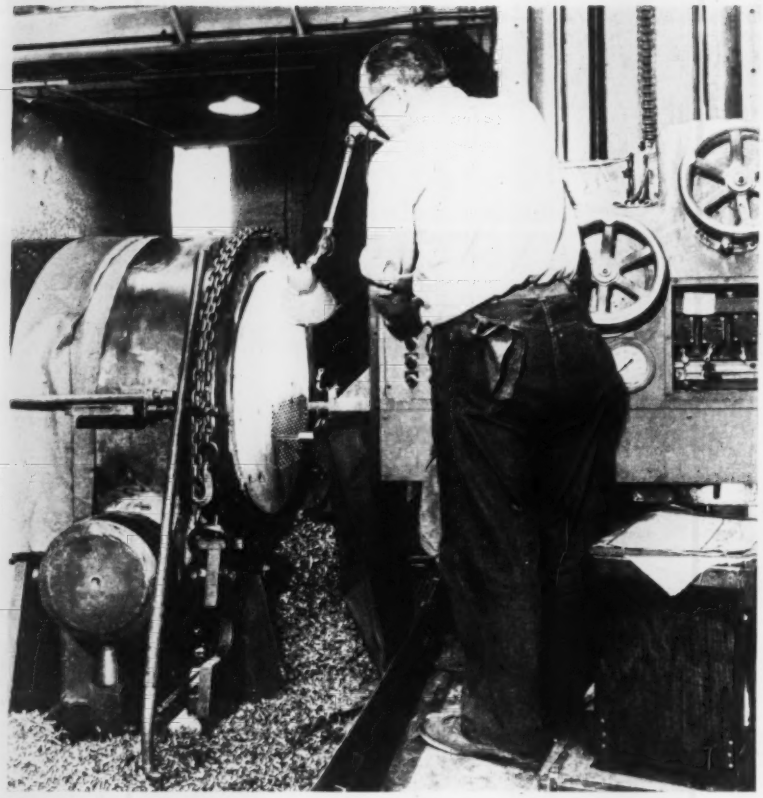


Kodak



This gun drill produces a closely spaced pattern of tube holes required in the heads of high pressure feedwater heaters

Semiautomatic Gun Drill Solves Runout Problem

Maximum runout is now 0.006 in. per foot of hole depth, compared with 0.075 in. for conventional methods. High speeds and low feeds reduce thrust and curb deflections

A TROUBLESOME drill runout problem was solved by the development of a semiautomatic gun drill, says Griscom-Russell Co., Massillon, Ohio.

• It improved hole accuracy, eliminated secondary finishing, and permitted production shortcuts.

Maximum runout is now 0.006 in. per foot of hole depth vs. as much as 0.075 in. per foot for a $\frac{5}{8}$ in. hole with conventional twist drills. Average runout is less than 0.002 in.

Hole size is held within 0.001 in., and surface finishes of 15 microinches (on a single pass) can be produced.

• Case History—Twist drill runout had become an increasingly difficult problem as the trend toward higher pressures demanded thicker tube sheets for feedwater heaters. To solve the problem Griscom-Russell and Lahr Machine & Tool Corp., Toledo, Ohio, worked together to design the right gun drill equipment.

Griscom-Russell now uses two basic types: A core or trepanning type and a center cut type. Both operate at unusually high speeds and low feeds to reduce axial thrust and curb deflections.

Horizontal drilling simplifies chip removal. A high pressure, filtered coolant system also lubricates wear pads and ejects chips through an open vee in the drill shank.

Outboard bearings support the drill at the work face. Manual controls position the drill within 0.003 in. and automatically lock the drill in place hydraulically.

Preset feeds and speeds control forward motion through an automatic cycle that ends with automatic drill retraction. Any pattern of holes can be drilled within a 6 ft square by moving the drill head and supporting column.

• It's also a time saver for making low pressure heat exchangers, say the developers.

Higher production is possible by drilling through multiple layered stacks of thinner tube sheets and tube support plates. Besides reducing time requirements and costs, the technique gives better tube hole alignment in baffles, support plates, and tube sheets.

Asbestos Surfaced Rolls End Strip Scarring

An asbestos filled carrying roll ended a wear problem for a maker of strip steel. It operated inside an annealing furnace for seven months without replacement.

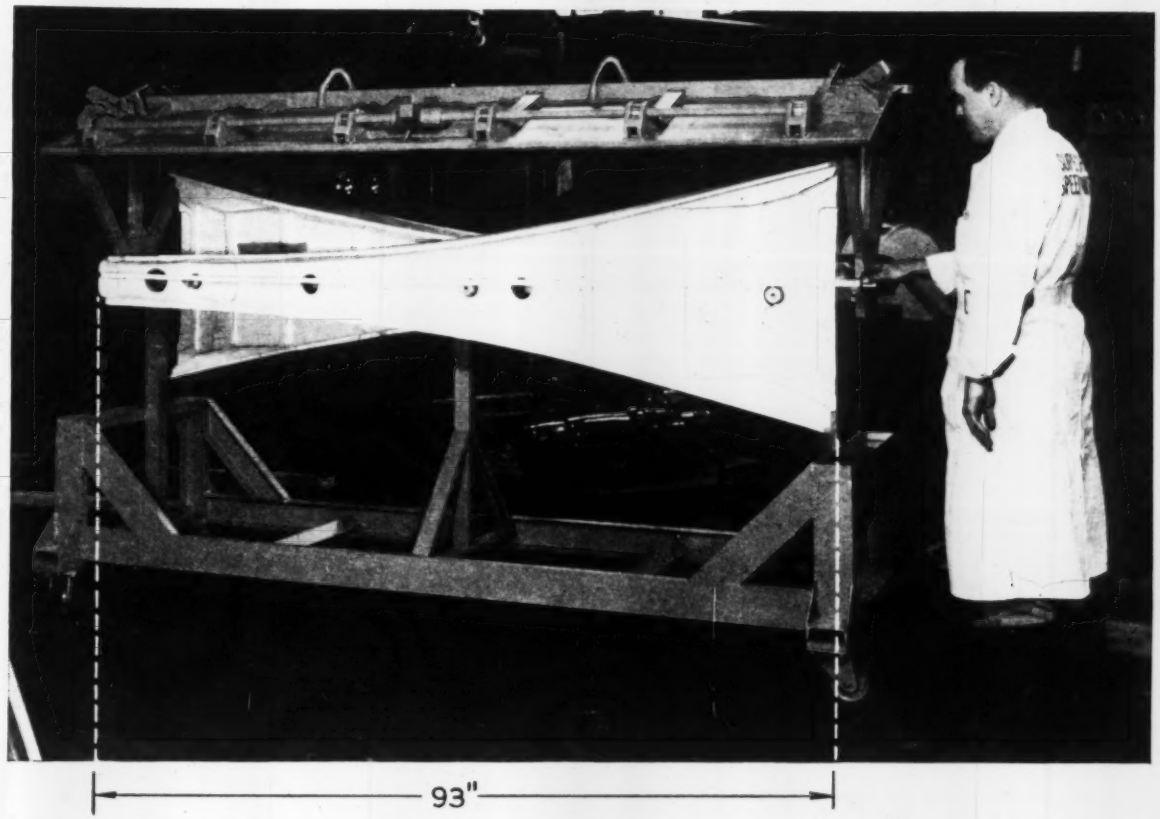
Resurfacing insures markfree strip. The steel comes in contact only with the asbestos surface.

Prior to this development, carrying rolls in annealing furnaces would deteriorate due to intense heat (2400° F) and leave visible marks on the strip.

Various types of rolls were tried. Appleton Machine Co., Appleton, Wis., suggested an asbestos filled roll. The company makes cotton filled rolls and other paper and pulp mill equipment.

The filled rolls are made on a large roll press (3500 tons hydraulic pressure).

Appleton says that asbestos filled rolls may also have an application in the plate glass industry.



Can parts this long be barrel finished?

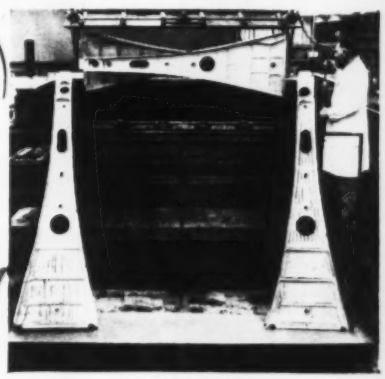
ALMCO Supersheen System — SUPERIOR MACHINES AND METHODS FOR FINER BARREL FINISHING.

YES! With ALMCO'S efficient, versatile barrel finishing equipment, the 93 inch wing spar above was finished in a two hour time cycle. Thirty inches long at the wide end and 8 inches thick, the spars are finished two at a time in a special ALMCO unit at McDonnell Aircraft Corp., St. Louis, Missouri. Previous hand methods required many additional hours of finishing time and it was difficult to maintain uniformity of the parts.

These aircraft wing spars are barrel finished to blend in radii and improve micro-inch finish on other surfaces through use of ALMCO Supersheen media and burnishing compounds. All surfaces receive the same treatment—rejects due to imperfect finishing are eliminated. Tremendous labor savings are made by using ALMCO's modern barrel finishing methods.

ALMCO's modern machines and methods—the Supersheen System—may help you achieve vital costs savings too. At ALMCO you receive trained counsel for your finishing problems . . . *free* sample processing in ALMCO's modern labs . . . skilled guidance in selecting the proper standard or custom-designed ALMCO machines and methods. Write today on your letterhead asking for an ALMCO sales engineer to call. Or send parts direct to ALMCO's lab with specs required.

Note "machining ridges" on foreground spars, prior to Almco Barrel Finishing. Supersheen Aluminum Oxide chips with Almco #10 compound are used in 2 hour finishing cycle.



NEWS ABOUT ALMCO'S NEW PRODUCTS!

New brochures now ready on Almco spindle machine, Vibrasheen, other cost saving units. Price list on Almco compounds and media included. Send for your Almco Album of New Products today!

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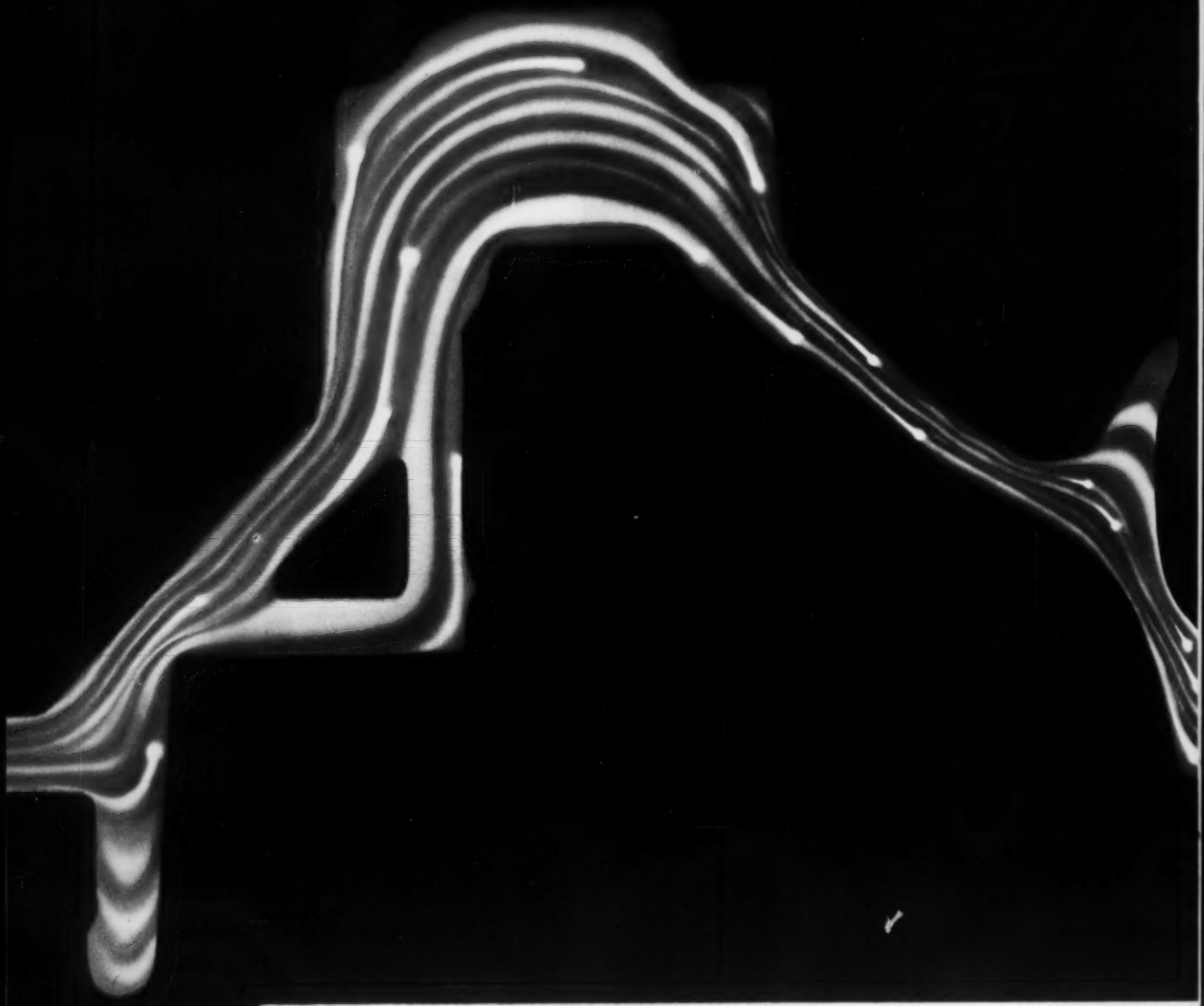


Fluid mapper pattern demonstrating liquid flow through a cross section of a Malleable differential carrier.

Versatility is Malleable

The ability to do most any job well is synonymous with Malleable iron castings. The variety of tasks they perform, from the commonplace to the spectacular, is legend. The strength and toughness . . . the freedom of design . . . the wide range of shapes and sizes . . . the excellent machinability . . . the economies achieved . . . all these advantages of Malleable combine to create an unexcelled reputation for versatility.

Whatever your needs, look first to Malleable.

For information or service, call on one of the progressive firms that identify themselves with this symbol—

MEMBER
MALLEABLE
CASTINGS COUNCIL

If you wish, you may inquire direct to the Malleable Castings Council, Union Commerce Building, Cleveland 14, Ohio, for information.

Versatility Is Key to Malleable's Increasing Use

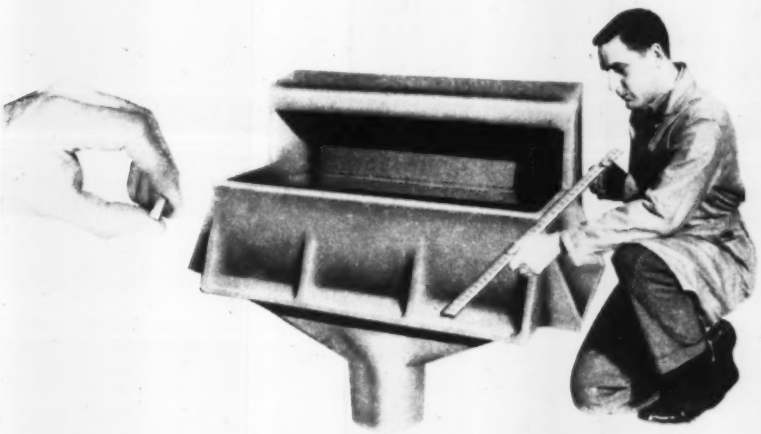
Recent metallurgical advances have made the Malleable irons a family of metals uniquely capable of meeting the most diverse design, production and performance requirements. Whether the vital consideration is high strength, toughness, ductility, hardness, machinability, high or low temperature performance, wear resistance, or economy and adaptability for complicated designs, Malleable castings have the versatility to meet exacting specifications.

For versatility of shape, the casting process is unexcelled. It permits direct production of the most complicated components. The metal is placed exactly where it is needed regardless of the intricacy of the design.

The capabilities of the metal to be cast are of even greater significance, for every application has a different set of requirements. Here, Malleable iron provides unique opportunities to obtain better parts at less cost.

Holes can be punched in Malleable, surfaces can be coined to meet rigid specifications. The pearlitic Malleables can be surface-hardened for even better wear resistance. These and other advantages make today's Malleable iron one of the most versatile engineering materials available.

Although Malleable iron's properties are flexible, depending on service requirements, certain relationships remain constant. Malleable provides more strength and toughness per dollar than any other metal. It is also the most machinable of all ferrous metals of similar properties.



Malleable castings can be produced in sizes ranging from the hammer handle wedge, shown here, weighing less than an ounce, to the 1,125 pound bridge scupper. Throughout this range is an endless variety of castings, best made of Malleable for highest quality at lowest cost.

Shapes and sizes of Malleable castings are virtually limitless. The combination of Malleable's good castability with modern production techniques regularly results in sections as thin as 1/16" and tolerances of ±.005" per inch in sections of 1", with excellent surface finishes.

Engineering Aids Available

While the design of Malleable castings is not complicated, it will pay you to consult a skilled Malleable engineer who can offer time and cost saving suggestions for the production of better parts. As another aid to basic Malleable casting design, a special folder — *Data Unit 104 — Design Versatility* — is available from any member of the Malleable Castings Council and from the Malleable Castings Council, Union Commerce Building, Cleveland 14, Ohio.

These companies are members of the

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15 Barrel Finishing Success Stories

WORKPIECES	OLD METHOD	OLD PIECE COST	NEW PIECE COST	ANNUAL SAVINGS
Zinc diecasting for business machines	Wheel beburring	$0.018	$0.00017	$ 6,632.00
Brass trim for plumbing fixture	Polishing lathes	0.0204	0.00109	
Part for aircraft instruments	Burr bench	0.365	0.033	3,139.09
Stainless part for aircraft equipment	Wire brush & bench grind	0.06	0.01	
Part for scales & food machines	Belt grinding	0.0045	0.000075	2,857.50
Pencil sharpener part	Belt sanders	0.008	0.0066	6,761.30
Gear	Hand filing	0.398	0.0635	6,680.00
Hardware	Buffing wheels	0.023	0.0017	2,130.00
Medical instrument part	Hand polishing	0.0425	0.0005	3,750.00
Bronze bearing wear plate	Sandpaper	0.0831	0.0323	9,510.00
Aircraft part	Lathe, buffing tools, wire brush	0.1040	0.0029	24,490.00
Screw machine product	Belt sanding	0.00435	0.00011	3,930.90
Dairy drink mixer part	Belt sanding	0.0137	0.0021	189.70
Roller bearing	Hand file	0.40	0.03	5,000.00
Oil burner part	Buffing	1.80	0.90	2,000.00

Source: Almco Div., Queen Stove Works, Albert Lea, Minn.

You may be overlooking a prolific source of dollar savings if you finish or deburr parts by hand methods. Today's equipment is automatic, handles a wide variety of operations

By LESTER F. SPENCER
Technical Adviser
Nuclear & Centrifugal Pump
Allis-Chalmers Mfg. Co.
West Allis, Wis.

"OUR finishing production of stainless valve parts is up 700 per cent with the barrel method. Surface finish is 25 microinches," says Alco Valve Co., St. Louis.

"We cut deburring and polishing costs for our needle plate forgings from $55 per 100 to 55 cents," says Landis Machine Co., St. Louis.

"We saved 75 per cent over hand deburring of jet vane and shroud assemblies," says another.

A switch to barrel finishing from hand methods saved 97.3 per cent for a fourth firm.

The method doesn't require skilled help. You get high returns on a comparatively low investment. Rejections are much lower than with hand finished pieces and the finish is much more uniform. The method is noted for its ability to finish parts to 3-7 microinches with a 0.0002 in. tolerance on radiuses.

• It's used for preparing or finishing surfaces and edges.

Typical effects include removal of skin, scale, and fins from castings and forgings; improved removal of burrs and wire edges; smoothing of rough spots and uniform conditioning of stampings; greater control of finishing with respect to color or appearance and microinch finish; and the control of radiuses.

Modern barrel finishing differs

from the old "rattling and rumbling" techniques. Scientific improvement of equipment, compounds, abrasive media, fixturing, and equipment layout have been coupled with semi and full automation to produce parts with a uniform finish.

You start with a rotating cylinder, or barrel, in which workpieces cascade while submerged in mixtures of mineral chips and chemical compounds.

Some methods involve a perforated drum which contains the workpieces and an abrasive. Stations are open tanks that contain a chemical compound and liquid. The barrel rotates submerged in each station, then proceeds to the next one.

You can also use automatic programing to control the cycle. Auxiliary equipment includes: Air-operated swivel chutes which meter abrasive chips from an overhead storage bin; vibratory feeders which control the flow of finished workpieces and abrasives; magnetic and vibratory screening units; and rotary screen classifiers for sorting.

Constant action by chips and compound gradually wears away any tool marks, burrs, scale, or other imperfections. The finishing mixture can be either wet or dry, but wet barrel finishing is more important and more widely used because of its greater latitude. It has a wider variety of media, and you can get a wider range of finishes and a better control of uniformity.

• Not all sizes and shapes can be handled.

Barrel finishing is most used on small and medium sized parts, although some 100 lb pieces have been processed. Parts up to 10 lb may be processed without fixturing, but you must "layer" them in the compartment with chips or a mixture of rubber and hardwood blocks to prevent nicking. Large intricate parts (jet rotor compressor discs, stainless steel channels, aircraft engine supports, and electric drill gun housings) need simple fixtures. They can be stationary or removable, but they must permit all part surfaces to be exposed to the media during processing.

The method handles all types of metals and alloys made by any production process. Many nonmetallics are finished this way. (An interesting application uses dry ice to freeze molded rubber parts. The thin, brittle sections are then broken off by the impact of the tumbling.)

• Control calls for consideration of several factors.

First, is it a metal? Hard or soft? Casting, stamping, forging, extrusion, or machined part? Large or small?

Second, what are you going to do to it (descaling, grinding or stock removal, deburring, improvement of surface color burnishing, degreasing and cleaning, radius forming, improvement of finish or reduction of porosity, inhibit rust)?

Third, you must control these variables:

1. The relationship of the equipment and part.

2. The number of operations required.

3. Production quantities.

4. The abrasive media.

5. Deburring and finishing compounds. (Proprietary compounds vary in acidity, alkalinity, and sizes to perform lubricating, rinsing, deburring, coloring, or dimensional control.)

6. Water level. (More slows the cutting action but promotes a fine finish. Less increases cutting.)

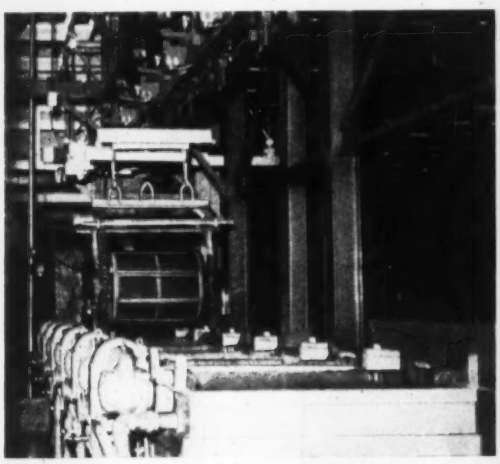
7. Time, which varies from 15 minutes to several hours.

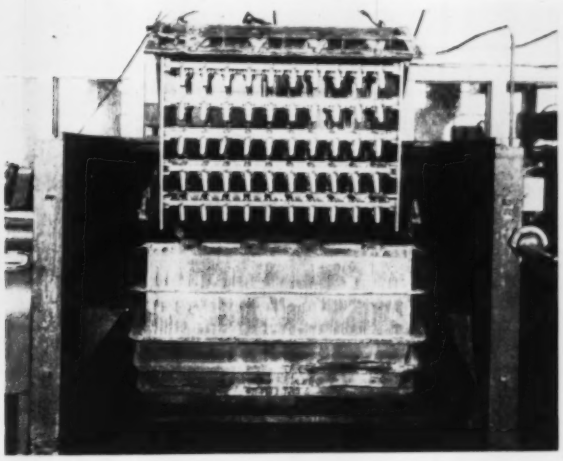
Location of burrs on the workpiece determines the time. Here's a simple test: Cut some stainless on a punch press into straight sections, "U" and "C" sections. You'll find it takes about 45 minutes to remove burrs on the straight sections, 2 hours for the "U" shapes, and 8 hours for the "C" shapes.

8. Rate of rotation.

9. Filling the barrel correctly. (You obtain maximum efficiency when barrel is 50 to 60 per cent filled. Sliding action is an important factor and is directly related to barrel speed. High speeds can cause nicking.)

• An extra copy of this article is available until supply is exhausted. Write Editorial Service STEEL, *Penton Bldg., Cleveland 13, Ohio.*



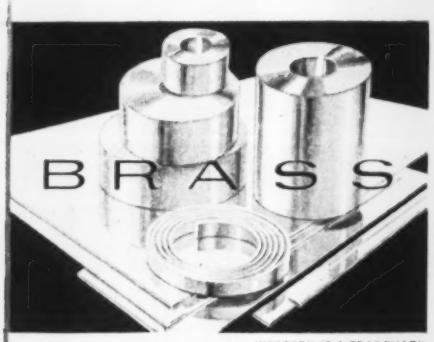


Batch type or in-line barrel finishing equipment demonstrates versatility. Fixture holds 100 electric drill housings during batch treatment. Overhead monorail carries barrels through a series of slurries automatically

If you're interested in a *modern metal* you should research *brass*... especially Western Brass... it's "*tailor-made*" for each job!

Western

*



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Preview of Material Handling Show

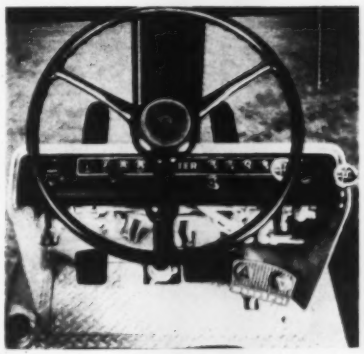
One Pedal Controls Truck Motion

EASIER, faster, and safer movement of more tonnage is possible with the new Hyster Monotrol system. The throttle and forward-reverse direction control are combined in one pedal to free the lift truck operator's hands for full time steering and load handling control. Dashboard pushbuttons for park and drive govern an automatic parking brake and engagement of the automatic transmission.

A single foot movement selects direction and controls acceleration. A touch of the toe at the left side of the Monotrol pedal shifts the transmission into forward range. Touch the toe pad at the right side of the pedal and the transmission shifts into reverse. Further depression at either side accelerates the engine.

Touch the park button on the dash and the transmission is in neutral, the automatic parking brake applied. The drive button releases the brake and returns the power flow to the wheels. If the engine is turned off, the parking brake is automatically applied.

Hyster is also introducing a series of redesigned cushion tire lift trucks of 3000, 4000, and 5000 lb capacity.



The Monotrol pedal (lower right) controls all truck movements

The SpaceSaver 40 is engineered for greater operator productivity

Human engineering, a vital part of the new Hyster design, insures greater operator productivity. Hydraulic control levers have been moved to the cowl, eliminating floorboard obstruction, and improving operator convenience. The dashboard has been redesigned for easier reading, providing at-a-glance checking of engine performance.

A full selection of options and attachments makes this a versatile series. In addition to Power-Shift Hystamatic with Monotrol, optional features are LP-Gas fuel conversion, wide tread drive wheels, a Monomast single upright, three stage upright, hydraulic and mechanical load handling attachments.

For more information, *write* Hyster Co., 2902 N. E. Clackamas St., Portland 8, Oreg.

Low Cost Hydraulic Truck Handles In-Plant Materials

WHEREVER large loads are stored or handled on pallets and skids, the BT lift truck is a valuable tool.

Ruggedly built, yet light in weight, the truck is highly maneuverable in limited space areas. Its built-in hydraulic system has wear resistant packings and it takes a minimum number of pump strokes to achieve a 5 in. lift.

Lowered height of forks is 3¼ in. and raised 8¼ in. Units are available in 2400 or 4400 lb capacities with 36, 42, or 48 in. fork lengths and 20½ or 27 in. fork widths.

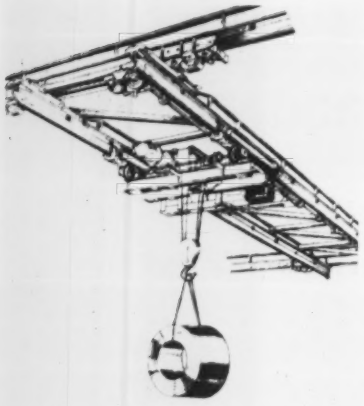
For more information, *write* Industrial Handling Equipment Co. Inc., 1225 W. Monroe St., Chicago 7, Ill.

Double Bridge Crane Has Increased Load Capacity

TWO advantages are claimed for the double bridge, motor operated, interlocking crane developed by American MonoRail Co.

The 5 ton capacity unit provides more headroom. Operators can bring the hoisting mechanism up between

NEW PRODUCTS and equipment



the two bridges and give greater hook clearance. Increased capacity is provided by spreading the weight over more trolley wheels.

The company will also spotlight a 2 ton MonoRail system which includes a double loop of track for operation of a MonoTractor and Hoist carrier for automatic or manual travel through track switches and dip section.

For more information, *write* American MonoRail Co., 13128 Athens Ave., Cleveland 7, Ohio.

Narrow Aisle Truck Does Job of a Larger Unit

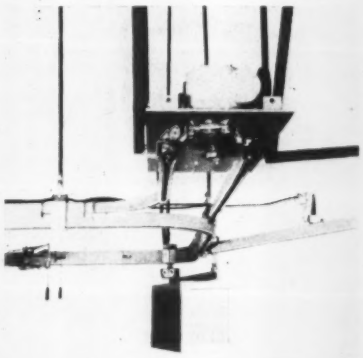
THE USE of rugged components, compactly arranged in the drive unit assembly of the heavy duty, 4000 lb capacity narrow aisle electric truck, makes it possible to meet the performance requirements of large counterweighted trucks, while enjoying the space saving features of narrow aisle units.

The truck has two drive motors, directly coupled to the large steerable wheels. Each of the drive motors has only one gear reduction, yet four separate speeds are provided for forward and reverse movement. The control of speed is obtained by varying the connection of the motors between series and parallel circuits to eliminate the power loss normally dissipated by resistors.

The turning radius of the large dual drive wheels permits 48 by 48 in. pallet loads to be right-angle stacked in aisles only 7 ft 6 in. wide. The unit has a narrow reach carriage for improved visibility.

For more information, *write* Raymond Corp., 91-174 Madison St., Greene, N. Y.

Route Selector Head Guides Conveyor Carriers



HERE is a power and free overhead conveyor system for applications involving storage banks, manufacturing work stations, segregation or integration of work carriers or inventory, and related material handling.

It is built to handle loads up to 600 lb per work carrier. A Telematic Route Selector dispatch head can be furnished to guide each carrier to any station.

For more information, *write* Conveyor Div., Columbus McKinnon Chain Corp., Tonawanda, N. Y.

Straddle Truck Works in Tight Areas

AN OUTDOOR truck, a rider type straddle truck, and two battery powered hand trucks will be introduced by Clark Equipment Co.

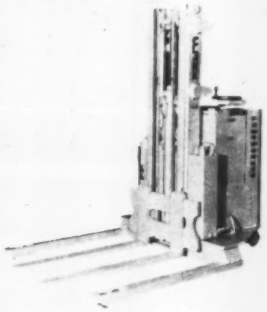
The 3000 lb capacity, outdoor fork truck with pneumatic tires has a two speed transmission, power shifted forward and reverse with a manually controlled creeper gear, and various optional drive tire combinations to provide power and traction for any type of terrain.

Dimensioned for maximum maneuverability, the unit has a 77 in. turning radius and will climb a 22 per cent grade under full load. It will travel 11 mph forward or reverse fully loaded.

The battery powered, rider type straddle truck is for tiering palletized materials in confined areas. It will carry capacity loads through aisles as narrow as 42 in. Its turning radius is 62 in. and it has travel speeds up to 4.6 mph with load in forward or reverse.

The Powrworker pallet truck and platform truck will move loads weighing up to 6000 lb. Both units have been significantly improved over previous trucks in this line. Changes have been made in the front frame, cylinders, and drive unit of the pallet truck. Lift linkages have been redesigned for longer life, and stronger, lighter forks are used.

Outdoor truck has optional drive and tire combinations to suit terrain



Rider type straddle truck can tier palletized materials in tight areas

Similar improvements have been made in the front frame, cylinders, and drive unit of the platform truck, and the lift linkage and trail frame have been completely redesigned.

For more information, *write* Industrial Truck Div., Clark Equipment Div., Clark Equipment Co., Battle Creek, Mich.

Pallet Lift Truck Has Low Weight-to-Capacity Ratio

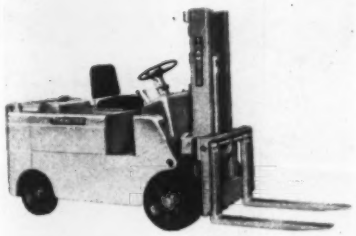
WEIGHING about 275 lb, the Colson Model HP-40 minimizes operator fatigue in handling 4000 lb loads. The unit is highly maneuverable, with a 240 degree turning radius.

The truck will be available in 25 and 27 in. widths. Fork lengths for either width are 30, 36, 42, and 48 in.

Double faced, the pallet lift truck comes equipped with NSI or plastic wheels.

For more information, *write* Special Products Div., Colson Corp., Somerville, Mass.

Truck Features Fast Fork Adjustments



Model 670 Pace-Maker truck has simplified suspension of forks

The Van-Stack unit can work in low headroom areas or stack loads high

FUNCTIONAL styling combined with advanced engineering features aimed at reducing operating and maintenance costs are designed into three new series of fork lift trucks introduced by Towmotor Corp.

The Pace-Maker series of heavy duty units has lifting capacities from 3 to 6 tons. Outstanding engineering feature of this line of trucks is a new carriage which provides for simplified suspension of the forks from a horizontal support shaft on the truck. This arrangement permits fast, easy adjustment of the forks for handling loads of various sizes, shapes, and character.

The Pace-Maker series includes cushion and pneumatic tire units which are available in five gasoline, LP-Gas, and diesel powered models.

The Stream-Liner series is for stacking in boxcars and low ceiling areas. Each truck has a special mast assembly that provides high free lift before increasing the overall lowered height of the lift truck.

Features of this truck line include transmission design that permits equal speeds forward and reverse, constant power industrial engines that can handle full capacity loads 24 hours a day, and a heavy duty hydraulic system that includes a direct drive hydraulic pump for fast, efficient lifting at speeds up to 50 fpm.

The Stream-Liner series is composed of eight gasoline, LP-Gas, and diesel powered models with lifting capacities from 2000 to 5000 lb.

The low profile, Van-Stack series provides the twin advantages of high warehouse stacking and easy access to vans, boxcars, and other low headroom areas.

The small over-all width and low over-all height permit efficient operation in narrow aisles and congested areas, allow easy entry into production, storage, and shipping areas with low door heights.

Towmotor will also show a new safety exhaust system for fork lift trucks, called Cool-Flow, which provides maximum protection against fire hazards.

For more information, *write* Towmotor Corp., 1226 E. 152nd St., Cleveland 10, Ohio.

NEW literature

Write directly to the company for a copy

Precision Instrument Parts

A 416 page catalog, No. 20, lists over 10,000 items, including gears, shafts, collars, couplings, speed reducers, differentials, and other parts available from stock. PIC Design Corp., 477 Atlantic Ave., East Rockaway, N. Y.

Carbide Selection Chart

A chart lists proper carbide grade selection and application and gives industry designations C-1 through C-14 cross-referenced with the designations of 15 producers of tungsten carbide. Adamas Carbide Corp., Kenilworth, N. J.

Beryllium Copper Alloys

A 12 page data sheet gives chemical analysis, physical constants, and mechanical properties of beryllium copper 10, 25, and 165 alloys. Pennrold Div., Brush Beryllium Co., 501 Crescent Ave., Reading, Pa.

Foundry Refractory Data

"Refractories for the Foundry Industry," 12 pages, tells how to select proper types for various foundry operations. Advertising Dept., A. P. Green Fire Brick Co., Mexico, Mo.

Industrial Rolling Doors

A catalog describes various types of rolling doors for industrial use. Kinnear Mfg. Co., 820-870 Fields Ave., Columbus, Ohio.

Lining Induction Furnaces

"Installing and Maintaining Basic Linings for High Frequency Induction Furnaces," 24 pages, describes the procedures in installing and patching rammed periclase refractory linings in furnaces used for making quality and specialty steels. Kaiser Aluminum & Chemical Corp., Kaiser Bldg., 1924 Broadway, Oakland 12, Calif.

Lubricant Selector

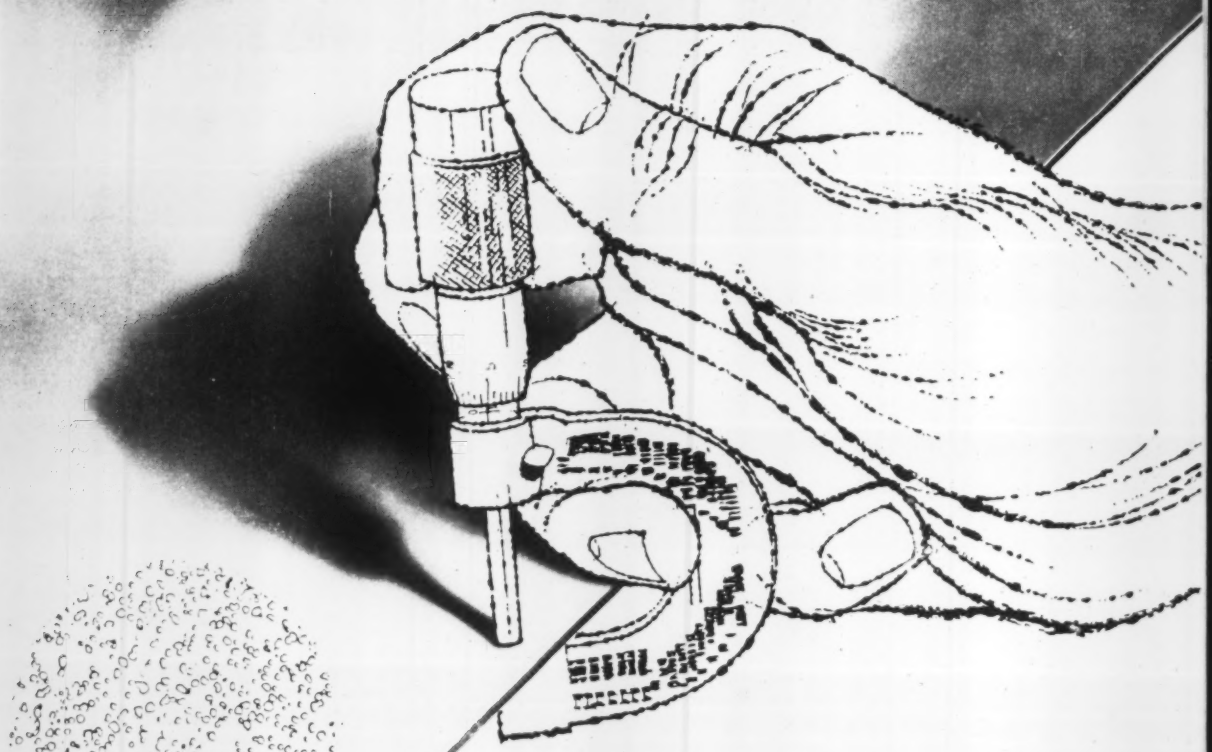
A selector chart evaluates every type in the Molykote lubricant line based on temperature, environment, method of application, incorporation into common materials, and recommendations for various parts, operations, and conditions. Alpha-Molykote Corp., Stamford, Conn.

Reactor Metals Data

Available forms and sizes of boron-stainless steel alloys, hafnium, columbium, tantalum, vanadium, zirconium, and Zircaloy, are described in an 8-page bulletin, IND-20. General Plate Div., Metals & Controls Corp., Attleboro, Mass.

Pipe Dimensions, Weights

A technical data card, TDC-191, gives the dimensions and weights per foot of pipe in sizes $\frac{1}{8}$ through 36 in. for all schedules. Tubular Products Div., Babcock & Wilcox Co., Beaver Falls, Pa.



J&L COLD ROLLED SPRING STEELS.. PRECISION INSIDE AND OUTSIDE

INSIDE—Microstructure control through processing techniques developed by J&L offers important advantages. For example, improved stamping, forming and drawing qualities; uniform response to heat treatment; reduction of heat treating distortion. This product is available in various internal structures and is also available in all hardness ranges—dead soft, intermediate and spring tempers.

OUTSIDE—Superior gauge accuracy of J&L precision spring steels made possible by specially developed rolling mill equipment and techniques, saves production dollars. For example, elimination of grinding for gauge accuracy; lower inspection costs; longer tool life; smoother surface finishes.

Investigate the cost-saving possibilities offered by J&L cold rolled spring steels. Contact J&L Stainless and Strip Division, Youngstown 1, Ohio.

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June 1, 1959

Record Output Seen for First Half

STEELMAKERS are well on their way to their biggest half year in history. Last week's operations were scheduled at 94.5 per cent of capacity, a rate that would yield 2,675,000 ingot tons. Even if production fell short of expectations, as it has in every week since Apr. 20, it was big enough to assure record breaking output in May. Last month's production (more than 11,646,000 tons) topped the 11,567,745 tons poured in March.

Operations will decline slightly this month, but output probably won't be less than 10.9 million tons. First half production will be a record 64 million, easily surpassing the 62.6 million turned out in the corresponding period of 1956.

WHY MILLS MISS TARGETS—Steelmakers have repeatedly fallen short of their production estimates in recent weeks because of furnace breakdowns, wildcat strikes, slowdowns, and hot weather absenteeism. If negotiations for a new labor contract don't take a turn for the better pretty soon, operations may go into a tailspin. Unauthorized strikes will multiply. Steelmakers will have to start banking their furnaces by June 15 to prepare for a July 1 walkout.

SHIPMENTS AT PEAK—Consumers are pressing the mills for delivery of everything they've ordered before June 30, but steelmakers won't be able to keep all their commitments. Reason: They've had unexpected production setbacks. At Chicago, suppliers are a month behind schedule on sheets and four to five weeks behind on plates. Fortunately, transportation bottlenecks (shortages of trucks and railroad cars) haven't been as serious as steelmakers feared. June shipments (about 8.3 million tons) will be second only to last month's 8.7 million.

115 MILLION TON YEAR—This year's steel production should total "perhaps 115 million ingot tons, a 35 per cent increase over the depressed level in 1958," says Clifford F. Hood, former president of U. S. Steel Corp. Others who share that opinion include Jones & Laughlin Steel Corp.'s Avery C. Adams, Bethlehem Steel Co.'s Arthur B. Homer, and Republic Steel Corp.'s Charles M. White. If they're correct, the year might shape up like this: First quarter, 82 per cent of capacity, 30 million ingot tons; second quarter, 92 per cent and 34 million tons; third quarter, 63 per cent and 23 million; fourth quarter, 75 per cent and 28 million.

THIRD QUARTER OUTLOOK—Strike or not, about 19.5 million tons of finished steel will be consumed in the third quarter (vs. 18.6 million in the first; 20.4 million in the second). Big users during the summer months will be the automotive, appliance, construction, canning, railroad, and petroleum industries. Assuming no strike and production of 23 million ingot tons, about 16.5 million tons of finished steel will be shipped. Net inventory reduction will be about 3 million tons.

IMPORTED STEEL PRICES UP—In the first two months of the year, imported steel products outweighed exports by 43 per cent (470,138 tons vs. 328,961). Since February, prices of foreign material have gone up $10 to $12 a ton. Unless there's a strike, imports will probably level off at about 240,000 tons a month.

WHERE TO FIND MARKETS & PRICES

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*Current prices were published in the May 25 issue and will appear in subsequent issues.

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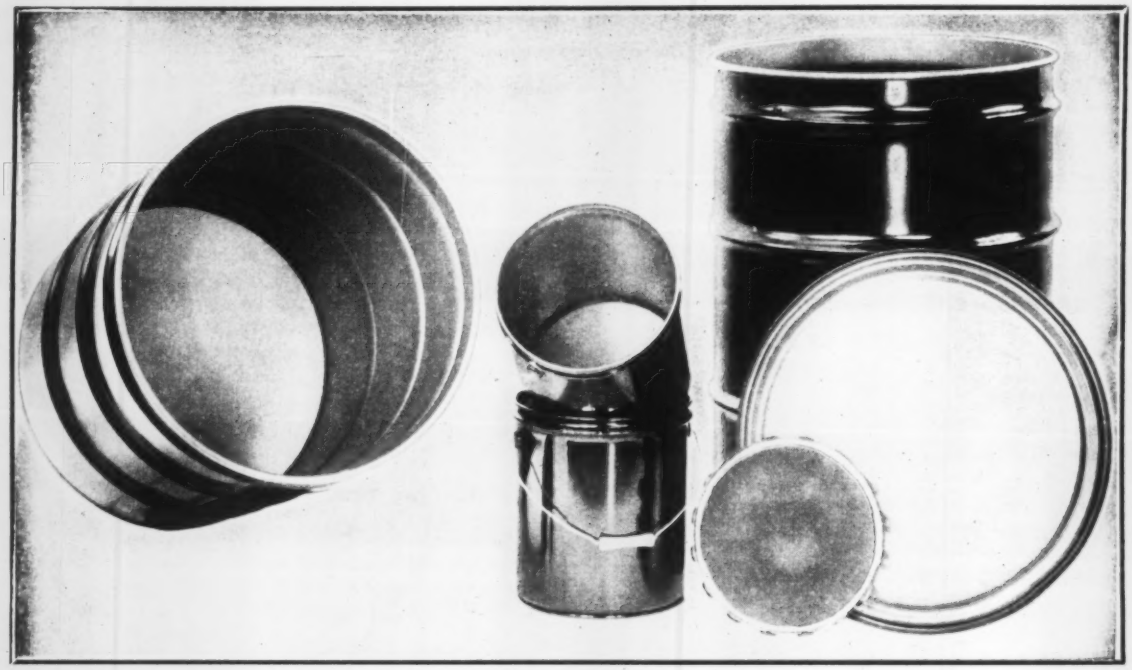

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How Much Oxygen Does a Steel Mill Use?

STEELMAKERS are using record quantities of oxygen.

They may consume more than half the 80 billion cu ft that will be produced this year. Last year, 64.5 billion cu ft were produced.

During this year's first quarter, steelmakers used more than 391 cu ft per ton of ingots produced (vs. about 260 last year, 170 in 1957), reports a leading oxygen supplier. In 1945, the average was around 105 cu ft; ten years earlier, it was only 38.

• One reason for the growth is the sharp increase in oxygen consumption for open hearth roof jets.

Only in the "study stage" in 1956, it's the biggest single metallurgical use today (see table). Roger M. Blough, chairman, U. S. Steel Corp., attributes many production records to the increased use of oxygen in the open hearth.

• Basic oxygen converter requirements are expanding rapidly.

The U. S. has 4,033,160 tons of oxygen steelmaking capacity—2.7 per cent of total capacity. There were only 540,000 tons in 1957 and 1,081,000 last year.

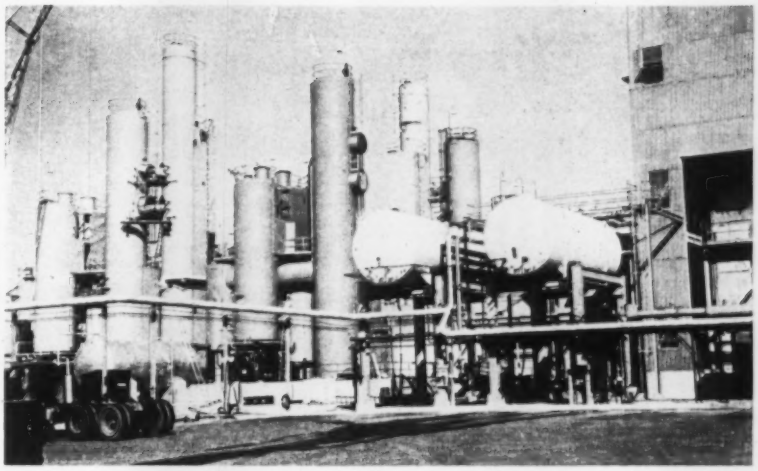
Four companies operating 12 furnaces account for the total: Acme Steel Co., 451,760 tons (two units); Jones & Laughlin Steel Corp., 756,000 tons (two units); Kaiser Steel Corp., 1,440,000 tons (three units); McLouth Steel Corp., 1,385,400 tons (five units). Further expansion is planned and more companies are interested.

Canada has 1,110,000 tons of oxygen steelmaking capacity—710,000 at Dominion Foundries & Steel Ltd. and 400,000 at Algoma Steel Corp. Ltd.

The American Iron & Steel Institute reports 837,385 tons of steel were produced by the basic oxygen process in the U. S. during 1959's first four months. April output (237,000 tons) was the highest—71.5 per cent of capacity.

• The oxygen process is showing tremendous growth potential.

The basic oxygen process is the first significant breakthrough at the



Kaiser Steel Corp.

This generating plant is typical

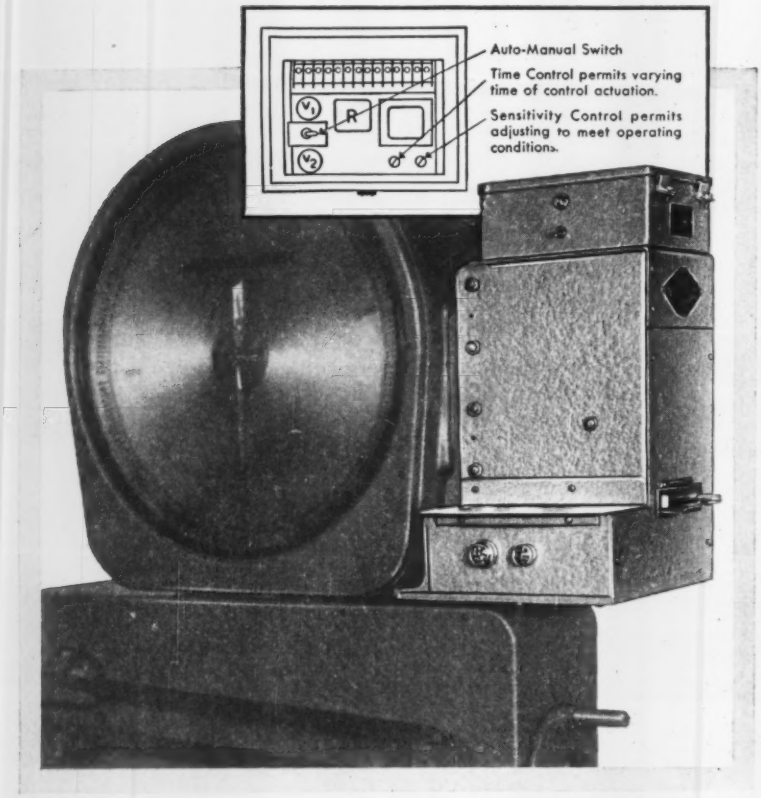
Here's the average monthly consumption for a hypothetical mill, based on a survey of more than two dozen representative users. The average mill uses 391.4 cu ft per ingot ton produced.

Application	Cubic feet	Per cent of total
O. H. combustion	5,753,333	13.5
O. H. decarburization	2,148,000	5.0
O. H. roof jets	8,107,000	19.2
Elec. scrap melt	53,333	0.1
Elec. decarburization	1,370,000	3.3
Desiliconization	333	*
L-D top blowing	2,206,666	5.2
Bessemer	50,000	0.1
Blast furnace	3,159,666	7.4
Special uses	68,333	0.1
Total metallurgical	22,873,669	53.9
Machine scarfing	8,428,333	19.8
Manual scarfing	6,699,000	15.7
Scrap preparation	2,133,666	5.0
Furnace tapping & maintenance	896,000	2.1
Plate & slab cutting	527,000	1.2
Maintenance & construction	961,000	2.3
Total nonmetallurgical	19,644,999	46.1
Total (all uses)	42,518,668	100.0

Source: Linde Co., division of Union Carbide Corp.

*Less than 1/10 of 1 per cent.

NEW Fairbanks-Morse Electronic Weight Detector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See Sweet's Plant Engineering File for full line of F-M Scales

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ingot level in this century, asserts Avery C. Adams, chairman and president, Jones & Laughlin Steel Corp. He believes it will make big inroads in the industry during the next few years.

J&L is planning two top-blown pure oxygen furnaces (it has this type at Aliquippa, Pa.) at its Cleveland Works to produce 160 ton heats. Capacity: 1.2 million tons annually. The firm has already put oxygen lances on three 220 ton stationary open hearths in Cleveland.

Kaiser Engineers Div., Henry J. Kaiser Co., predicts that, by 1965, L-D process installations in the U. S. will account for 45 million annual ingot tons of capacity or 25 per cent of total domestic capacity. (Kaiser Engineers is the licensing agent in the U. S. for the L-D process.) The firm says the process will account for 35 per cent of foreign steelmaking capacity. That means the potential oxygen usage in 1965 for this process would be 11 times that of the present—assuming usage per ton remains the same.

• The oxygen process offers cost advantages.

R. N. Merk, chief engineer, Sharon Steel Corp., asserts: "We have probably seen the last new open hearth shop built in the U. S." Reason: Oxygen facilities cost about $15 per ton of annual capacity vs. $18 for electric furnaces and $35 for open hearth furnaces (based on 1 million tons of annual capacity), says Mr. Merk. He reports further savings due to low brick consumption, high metallic yields, and simplicity of operation.

Dravo Corp., Pittsburgh, is introducing the Stora-Kaldo process to the U. S. Developed in Sweden, it uses an inclined, variable speed, rotating furnace to reduce pig iron to steel.

• Direct reduction processes are getting considerable attention. Some use oxygen.

An H-iron plant (process developed by Hydrocarbon Research Inc. and Bethlehem Steel Co.) to produce 50 tons daily is under construction at Alan Wood Steel Co. It'll make sinter-grade powder and briquettes (to be tested as feed material for open hearths). Bethlehem will build an H-iron plant at Los Angeles.

• **Expect metallurgical requirements for oxygen in the steel industry to expand faster than other needs.**

Three years ago, they accounted for around 40 per cent of total consumption; now the figure is about 54 per cent.

Nonmetallurgical uses are expanding, too. Machine scarfing is still the largest single use for oxygen in the steel industry. It accounts for 19.8 per cent of the average plant's consumption.

Demand for Import Steel Slows as Prices Advance

Prices on imported steel have been rising of late, and the higher levels, combined with more extended deliveries, have resulted in a leveling off in demand for European steel products.

Buying of strip and galvanized sheets from foreign mills continues brisk due to severe shortages in domestic supplies. Normally, the items aren't much of a factor in import trade.

Higher prices are being quoted on most imported products. In the southwest, quotations have gone up $10 to $12 a ton since February, but they are still $34 under the domestic market. (New prices of imported steel are reported on Page 134.)

Sheets, Strip . . .

Sheet & Strip Prices, Pages 129 & 130

Sheets continue the most active of all the major steel products. Second quarter order books are full, and buyers are specifying freely for the summer months while pushing hard for shipments on June commitments. Midwest mills will be three to four weeks behind on hot rolled shipments at the end of this month. One producer of electrical equipment says its hot rolled suppliers are seven to 14 days behind on deliveries.

Demand pressure is intensified by the prospect of no early settlement of the steel wage dispute; also, the fact consumption is so heavy it's impossible for manufacturers to hit their inventory targets. Manufacturers holding the best inventories are believed to be automotive and home appliances. Both industries got on mill books early.

The sheetmakers are gradually

STEEL WAREHOUSE "TAKES TO THE AIR"

Fig. 1 — TRAK-RAK fork lift at top of column, lifting bundle of steel rod. Unit serves 3 long aisles of racks.

TRAK-RAK SYSTEM INCREASES STORAGE SPACE, SAVES 22% CAPITAL BUILDING INVESTMENT

When A. C. Leslie & Co. Limited, needed more storage area in its busy Toronto steel warehouse, it decided to "reach for the ceiling" with a Chicago Tramrail TRAK-RAK System of vertical storage and handling. As a result, the company estimates it not only saved 22% of projected capital building costs, but increased the overall efficiency and speed of the Toronto operation. The company expects to gain further economies as the TRAK-RAK system is used to its full extent.

A 5 ton capacity toprunning TRAK-RAK Crane was installed in each of two 40 ft. wide bays to serve specially designed 18 ft. high material storage racks (Fig. 1) Each crane bridge has an overhead trolley, from which is suspended an electrically operated rotating column

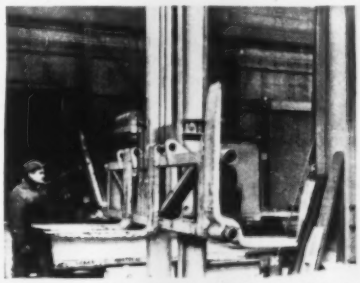

Fig. 2 — Carriage equipped with 2 pairs of forks. Operator is flopping outer forks up.

equipped with a special fork lift. All operations of the fork lift, which revolves to serve either side of the aisles, moves toward or away from the racks, and raises or lowers on the column, are controlled by the operator who rides with the carriage.

Two pairs of forks are mounted on the carriage. The outer forks may be flopped back (Fig. 2) leaving the inside forks in position for handling palletized or crated material. For handling long boxes, bars, etc., the outside forks are flipped back into working position.

A TRAK-RAK feature which added to handling speed and insured safe operation was the safety interlock switch system which prevents the column from running

Fig. 3 — TRAK-RAK column requires minimum aisle space for operation.

into a rack and permits full rotation only when the unit is safely beyond the end of the racks.

The A. C. Leslie Company reports that a similar TRAK-RAK System installed in its Montreal warehouse permitted a 37% savings in capital building investment with equally good operating efficiency and economy.

For complete details on the TRAK-RAK System of vertical storage and handling, write the manufacturer:

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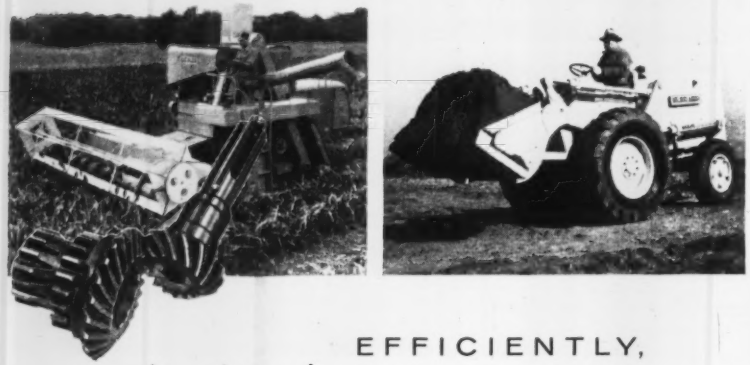

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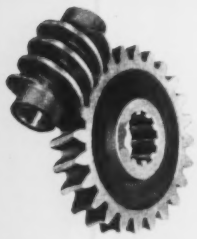

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filling their third quarter order books, and operations for the period are shaping up better than had been expected.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 129

Reinforcing bars and wire mesh are in peak demand, and are likely to continue so through the summer. The mills are shipping everything they can produce, although at some market centers, notably in the Southwest, domestic suppliers are encountering severe competition from foreign bars.

Steel Bars . . .

Bar Prices, Page 128

Unless barmakers are hampered by wildcat strikes and slowdowns the latter part of this month, they don't expect much carryover (of hot rolled and cold drawn) at the end of this quarter. Operating at capacity the last couple of months, their carryover from May was no larger than normal (seven to ten days).

Production at U. S. Steel Corp.'s Duquesne Works in the Pittsburgh district recently was held up two days by a wildcat strike of maintenance workers. Also, some shipments have been delayed by a shortage of trucks, though the traffic problem has not been as severe as had been anticipated. It probably will worsen in the next three weeks.

Wire . . .

Wire Prices, Pages 130 & 131

Wire order books are full for June, and business is being placed for July and August shipment—normally, there is a falloff in demand both months.

A major slice of wire products business is going to importers. Domestic producers of barbed wire have been so hard hit the federal government is reported showing some concern. It's said one mill was contacted by an agent of the U. S. Engineers expressing fear the defense effort is being weakened by lack of U. S. production of barbed wire.

The Engineers' representative is reported to have suggested that perhaps barbed wire machines should be mothballed. Producers say a more sensible solution of the

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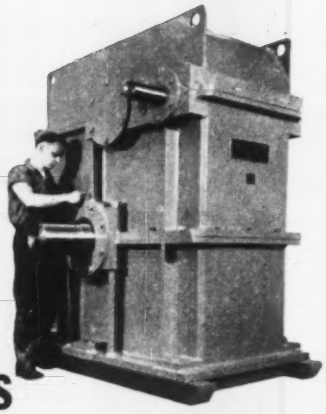

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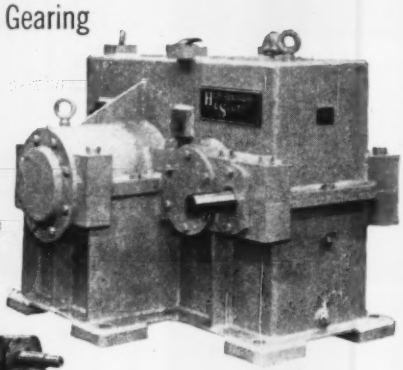

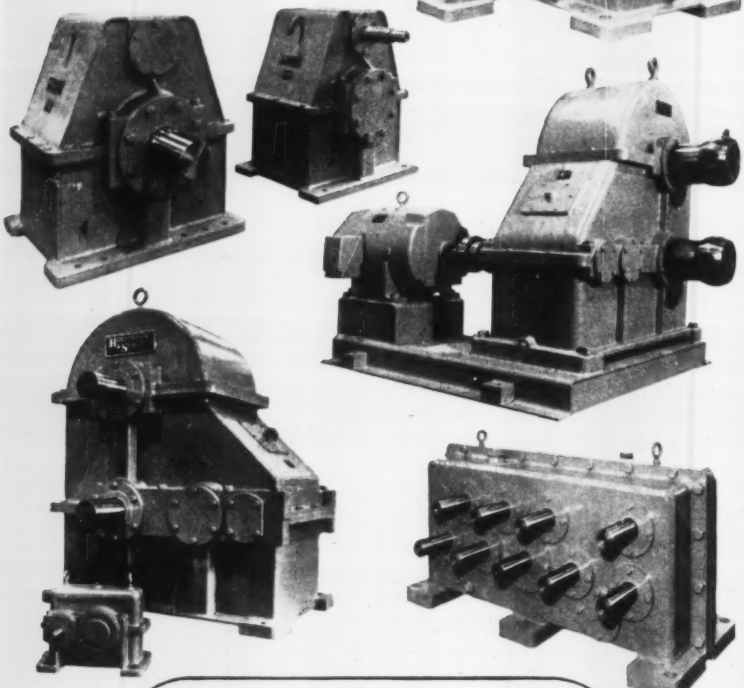

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problem would be to restrict imports.

Tubular Goods . . .

Tubular Goods Prices, Page 132

Seasonal expansion in construction is reflected in a steady build-up of standard pipe order backlogs. A Pittsburgh producer says: "Standard pipe was the last of our products to fill up. Now it's sold out for the first half too."

Less inventory has been built in this pipe category than in others—probably because most of the tonnage is bought by jobbers.

Also reflecting the seasonal expansion in building and construction, cast iron pipe sellers are booking substantial business. Municipalities are ordering steadily. Pending awards include 1400 tons for Mercer Island, Seattle, water district.

Orders for oil country tubing and casing have tapered off the last couple of weeks.

Distributors . . .

Prices, Page 133

Steel service centers are placing substantial orders with mills, anticipating a pickup in business should a strike develop. They are especially interested in acquiring structurals, since they are the principal source for miscellaneous lots for construction which is expected to be heavy this summer.

Mill deliveries are running six weeks behind schedule in some instances. Sheets are in short supply. Plates are short in some districts.

Semifinished Steel . . .

Semifinished Prices, Page 128

Midwestern observers say steel ingot production is falling behind estimates. That's mainly because of maintenance problems, scattered strikes, and a general letdown following the rapid pace of the last several months.

Equipment has been pushed steadily for weeks, and repairs have been put off as long as possible. Rehabilitation now will take longer.

Fortunately, transportation hasn't been the bottleneck that had been expected. But it may become more of a problem later this month.

Usually when steel demand is acute, talk is heard of conversion

deals. Currently there is no such talk.

Ceco Steel Products Corp., Chicago, expects to put its new $11 million steel mill at Lemont, Ill., into operation Sept. 1. First steel was melted in one of two 18-ton electric furnaces Apr. 6. The second furnace began operating about a month later. The two furnaces, which have a rated capacity of 120,000 tons of ingots annually, will continue to operate to build up an inventory of billet-size ingots for the rolling mill.

Ferroalloys . . .

Ferroalloy Prices, Page 136

Imports of ferromanganese totaled 3573 net tons in February. They were from: South America, 117 tons; France, 1061; other Europe, 610; Japan, 1785.

No spiegeleisen was imported in the month. Other imports included 368 tons of ferrosilicon, 1783 tons of ferrochrome, and 98 tons of other ferroalloys.

Structural Shapes . . .

Structural Shape Prices, Page 128

Fabricators are pressing the mills for structurals on order for delivery this quarter, and pressure is expected to mount as the threat of a steel strike becomes more ominous. Producers may not be able to get all shipments out before the strike.

There has been a substantial amount of forward tonnage placed with the mills, some of which are now pretty well booked up through July. In addition they will have carryover from June.

Chief stringency continues to be in wide flange sections.

Bonneville Power Administration has not yet placed 14,000 tons of tower steel on which an Italian fabricator was low bidder.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

1150 tons, wings No. 7 and No. 8, Bancroft Hall, U. S. Naval Academy, Annapolis, Md., to Atlas Machine & Iron Works, Arlington, Va., through Baltimore Contractors Inc., Baltimore, general contractor.

1150 tons, state bridgework, Bronx County, N. Y., through Tully & Di Napoli, general contractor, to Harris Structural Steel Co., New York.

860 tons, three stringer composite bridges, Medford-Stoneham, Mass., to American Bridge Div., U. S. Steel Corp., Pittsburgh; C. J. Maney Co. Inc., Lexington, Mass., general contractor.

450 tons, apparatus service building, General Electric Co., Pittsburgh, to Levinson Steel Co., Pittsburgh.

350 tons, addition and alterations, Brooklyn Preparatory School, Brooklyn, N. Y., through Frank D. Roesch Inc., Richmond Hill, N. Y., general contractor, to Schacht Steel Construction Inc., New York.

275 tons, miscellaneous structurals, Fairchild Field, Wash., to Union Iron Works, Spokane, Wash.

250 tons, five aluminum bulkhead units and steel bulkhead beams, Greenup lock and dam, Greenup, Ky., to Allied Structural Steel Co., Chicago, bids direct to U. S. Engineer, Huntington, W. Va.

230 tons, high school addition, Woodstock, Ill., to Vierling Steel Works, Chicago.

200 tons, three span, rolled beam bridge, Naugatuck River, Litchfield - Harwinton, Conn., to McDermott Steel Specialties Co., North Haven, Conn.; Charter Oak Construction Co., Hartford, Conn., general contractor; 70 tons of reinforcing bars to Scherer Steel Co., East Hartford, Conn.

200 tons, state bridgework, Litchfield, Conn., through Charter Oak Construction Co., general contractor, to McDermitt Specialties, North Haven, Conn.

150 tons, slag plant addition, Gary, Ind., for Vulcan Materials Co., to Vierling Steel Works, Chicago; John F. Meissner Engineers Inc., Chicago, general contractor.

125 tons, girders for Rock Island Railroad, to Vierling Steel Works, Chicago.

STRUCTURAL STEEL PENDING

1290 tons, state bridgework, Steuben County, N. Y.; bids June 4.

1200 tons, approachwork, George Washington Bridge, New York, with 500 tons for Sections 5 and 6, and 700 tons for Section 9, pending.

1105 tons, state bridgework, Warren County, N. Y., Torrington Construction Co., Torrington, Conn., low on general contract.

1000 tons, gymnasium and athletic building, St. John's University, Queens, N. Y., bids June 9.

940 tons, five composite rolled beam bridges, Lebanon-Bozrah-Norwich, Conn.; bids June

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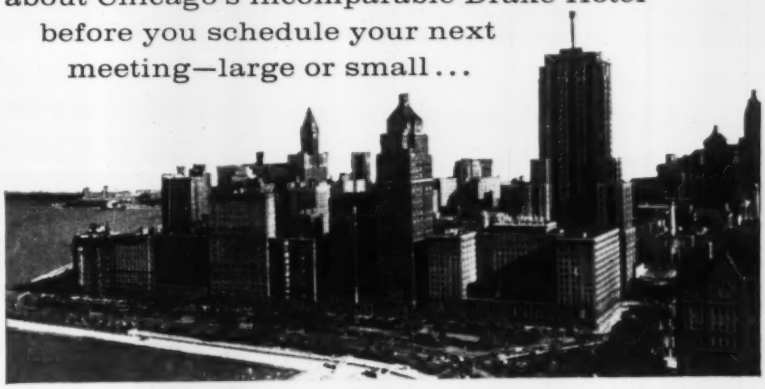

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S. Hartford, Conn.; also, 495 tons, concrete reinforcing bars, and 215 tons, steel piles.

900 tons, subway station, E. 59th St. and Lexington Ave., New York, for New York Transit Authority, bids June 5.

655 tons, state bridgework, Onondaga County, N. Y., Harrison & Burrows, Jersey City, N. J., low on general contract.

520 tons, state bridgework, Columbia County, N. Y., D. B. Frione, New Haven, Conn., low on general contract.

500 tons, nuclear laboratory, Atomic Energy Commission, Upton, N. Y.; bids closed May 28.

500 tons, ten tanks, Idlewild Airport, New York Port Authority; bids closed May 26.

350 tons, powerhouse, New York State University, Albany, N. Y.; bids June 10.

337 tons, state bridgework, New York County, N. Y.; bids June 4.

180 tons, 312 ft bridge, Sioux Falls, S. Dak.; bids June 16, to U. S. Engineer, Omaha, Nebr.

REINFORCING BARS . . .

REINFORCING BARS PLACED

960 tons, wings No. 7 and No. 8, Bancroft Hall, U. S. Naval Academy, Annapolis, Md., to Ceco Steel Products Inc., Philadelphia, through Baltimore Contractors Inc., Baltimore, general contractor.

675 tons, missions engineering building, Redstone Arsenal, Alabama, to Ceco Steel Products Inc., Birmingham; Daniel Construction Co., Birmingham, general contractor.

490 tons, laboratory and shop buildings, Ft. Bliss, Tex., to Structural Metals Inc., Sequine, Tex.; Robert E. McKee, El Paso, Tex., general contractor.

400 tons, addition, Cooley Dickinson Hospital, Northampton, Mass., to Bethlehem Steel Co., Bethlehem, Pa., through Columbia Construction, Malden, Mass., general contractor.

360 tons, two men's dormitories, Ohio State University, Columbus, Ohio, to Pollak Steel Co., Cincinnati, through Garwick & Ross Inc., Columbus, Ohio, general contractor.

295 tons, replace Piers 12 and 13, submarine base, Groton, Conn., to Bethlehem Steel Co., Bethlehem, Pa.; J. R. White Contracting Co., Westwood, Mass., general contractor; also 300 tons, steel piles, to Bethlehem Steel Co., Bethlehem, Pa.

291 tons, Washington State highway bridges, King County, to Bethlehem Pacific Coast Steel Corp., Seattle; Ostruske-Murphy Co., Tacoma, Wash., general contractor.

265 tons, agricultural-engineering building, University of West Virginia, Morgantown, W. Va., to H. K. Porter Company Inc., Huntington, W. Va.; John McShain Inc., Baltimore, general contractor.

215 tons, four state highway bridges, Littleton, N. H., to Bethlehem Steel Co., Bethlehem, Pa.; Munroe-Langstroth Co., Norwood, Mass., subcontractor for bridges; 240 tons, steel piles, to Bethlehem Steel Co.

200 tons, parking garage, Seattle, to Bethlehem Pacific Coast Steel Corp., Seattle; Utah Construction Co., Seattle, general contractor.

180 tons, Montana highway bridge, Silver Bow County, to Bethlehem Pacific Coast Steel Corp., Seattle; Peter Kiewit Sons Co., general contractor.

125 tons, petroleum lubrication facilities, Naval Radio Station, Cutler, Maine, to Bancroft & Martin Rolling Mills Co., South Portland, Maine; Robert A. Verrier Construction Co., Portland, Maine, general contractor.

120 tons, post office and courthouse, Leavenworth, Kans., to Truscon Steel Div., Republic Steel Corp., Kansas City, Mo.; Bennett Construction Co. Inc., Kansas City, Mo., general contractor.

REINFORCING BARS PENDING

350 tons, General Stores Supply Office, Navy, Philadelphia; bids June 19.

260 tons, Idaho road passes, Bannock and Bingham Counties; C. H. Ellis Construction Co., Pocatello, Idaho, low at $1,132,643.

114 tons, Washington State, two slab bridges, King County; bids to Olympia, Wash., June 9.

PLATES . . .

PLATES PLACED

6230 tons, high tensile, Grade Hy-80, Navy Purchasing Office, Washington, to Lukens Steel Co., Coatesville, Pa.; same producer also awarded contract for fabricated heads, same grade, $429,807.

4600 tons, caissons, foundations, Prudential Tower Center, Boston, to James Russell Engineering Works Inc., Boston; plates to be supplied by Bethlehem Steel Co., Bethlehem, Pa.; George A. Fuller Construction Co., Boston, general contractor.

1735 tons, carbon hull steel, General Stores Supply Office, Navy, Philadelphia, to Phoenix Steel Corp., Harrisburg, Pa.

1050 tons, tanks for ballistic missile project, Fairchild Field, Washington State, reported to A. O. Smith Corp., Milwaukee; Patti-MacDonald & Associates, general contractor.

585 tons, medium high tensile hull, Grade M, pickled and painted, General Stores Supply Office, Navy, Philadelphia, to Enterprise Galvanizing Co., Philadelphia.

350 tons, three tanks, petroleum lubrication storage, Naval Radio Station, Cutler, Maine, to Chicago Bridge & Iron Co., Chicago; Robert A. Verrier Construction Co., Portland, Maine, general contractor.

310 tons, carbon hull steel, General Stores Supply Office, Navy, Philadelphia, to Phoenix Steel Corp., Harrisburg, Pa.

300 tons, three 250,000-gallon fuel storage tanks, f.o.b. Naval Construction Battalion Center, Davisville, East Greenwich, R. I., to Chicago Bridge & Iron Co., Boston.

200 tons or more, two water storage tanks, Kent, Wash.; American Pipe & Construction Co., Portland, Oreg., low at $108,084.

185 tons, aluminum 202T4, Naval Ordnance Plant, Louisville, to Aluminum Co. of America, Washington.

155 tons, medium tensile welding quality, Naval shipyard, Portsmouth, N. H., to Meldon Steel Co. Inc., Westbury, N. Y.; fabricating contract, bow structure (sonar dome) to A. F. Robinson Boiler Works, Cambridge, Mass.

PLATES PENDING

700 tons, 9760 ft of 48 in. water pipe; bids to John L. Sugars, clerk, Everett, Wash., June 10; alternatives invited.

250 tons or more, 10,000 ft, 36 in. electric welded; bids to Port Townsend, Wash., June 2.

PIPE . . .

CAST IRON PIPE PLACED

443 tons, 8 to 12 in., Kent, Wash., to U. S. Pipe & Foundry Co., Seattle.

396 tons, 4 to 12 in., District No. 49, Seattle, to Pacific States Cast Iron Pipe Co., Seattle.

171 tons, 12 in., District No. 68, Seattle, to Pacific States Cast Iron Pipe Co., Seattle.

115 tons, 4 to 8 in. for Clackamas, Oreg., to U. S. Pipe & Foundry Co., Seattle.

103 tons, Ambaum Water District, Seattle, to U. S. Pipe & Foundry Co., Seattle.

89 tons, 4 to 8 in., Mukilteo, Wash., to U. S. Pipe & Foundry Co., Seattle.

RAILS, CARS . . .

LOCOMOTIVES PENDING

Pennsylvania Railroad, 50 diesel locomotives, contemplated.

RAILROAD CARS PLACED

Atchison, Topeka & Santa Fe, 250, seventy ton covered hoppers, with 100 going to Pullman-Standard Car Mfg. Co., Chicago, 96 to Greenville Steel Car Co., Greenville, Pa., and 54 to ACF Industries, New York; the road has also placed 25 baggage cars with its Topeka, Kans., shops.

Rio Grande, 15 piggyback flatcars to Pullman-Standard Car Mfg. Co., Chicago.

Western Pacific, 25, fifty ton boxcars, with DF loaders, to Pullman-Standard Car Mfg. Co., Chicago.

Pennsylvania Railroad, to lease 1000, seventy ton triple hoppercars through Pullman-Standard Car Mfg. Co., which will build the equipment at Butler, Pa. The road will also lease 1700 gondolas from the General American Transportation Corp., and 300 flatcars from General Steel Castings Corp., Granite City, Ill. It is also reported negotiating for the financing of 5000 additional cars.

DISTRICT INGOT RATES

(Percentage of Capacity Engaged)

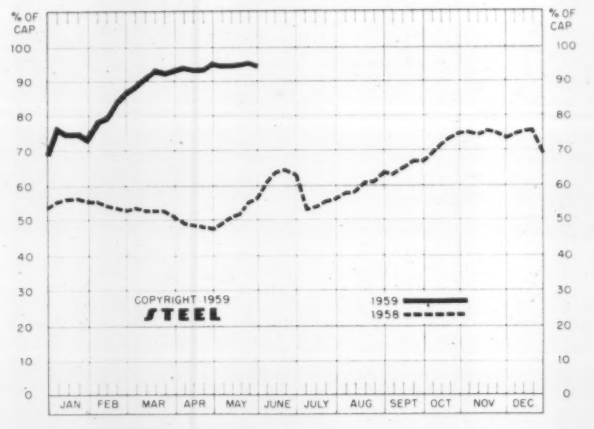
	Week Ended May 31	Change	Same 1958	Same Week 1957
Pittsburgh	95.5	+ 1.5*	55	88.5
Chicago	94.5	+ 0.5	64	89.5
Eastern	97	0	49	94
Youngstown	96	0	45	70
Wheeling	93.5	— 0.5	73.5	81.5
Cleveland	97.5	+ 4*	35	87
Buffalo	107.5	0*	46.5	95
Birmingham	95.5	— 0.5	66.5	92.5
Cincinnati	95	— 2*	63	85
St. Louis	103	+ 1.5*	87	90
Detroit	98	— 1.5*	57.5	87
Western	95	— 1.5	72	100
National Rate	94.5	— 1	56.5	86

INGOT PRODUCTION‡

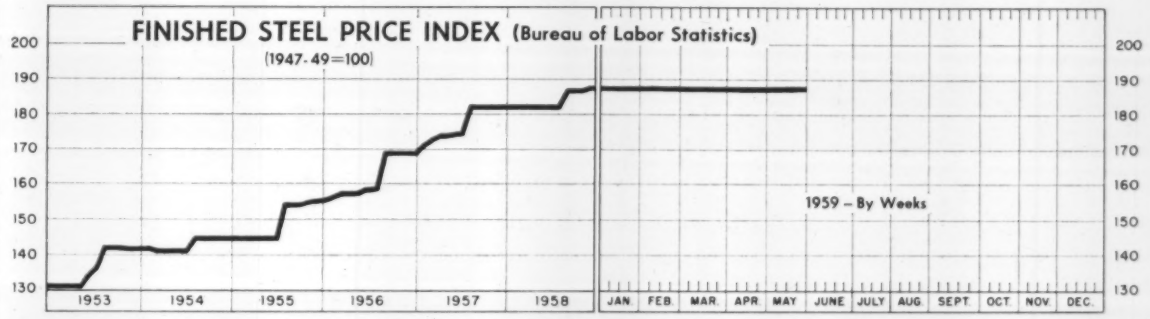
	Week Ended May 31	Week Ago	Month Ago	Year Ago
INDEX (1947-49=100)	166.3†	164.6	163.5	97.5
NET TON (In thousands)	2,671†	2,644	2,627	1,567

*Change from precednig week's revised rate. †Estimated. ‡American Iron & Steel Institute. Weekly capacity (net tons): 2,831,331 in 1959; 2,699,173 in 1958; 2,559,490 in 1957.

NATIONAL STEELWORKS OPERATIONS



Price Indexes and Composites



May 26, 1959	Week Ago	Month Ago	May Avg.	Year Ago
186.7	186.7	186.7	186.7	181.7

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended May 26

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them, write to STEEL.

Rails, Standard No. 1	$5.825	Bars, Reinforcing	6.385
Rails, Light, 40 lb	7.292	Bars, C.F., Carbon	10.710
Tie Plates	6.875	Bars, C.F., Alloy	14.125
Axles, Railway	10.175	Bars, C.F., Stainless, 302 (lb)	0.570
Wheels, Freight Car, 33 in. (per wheel)	62.000	Sheets, H.R., Carbon	6.350
Plates, Carbon	6.350	Sheets, C.R., Carbon	7.300
Structural Shapes	6.167	Sheets, Galvanized	8.615
Bars, Tool Steel, Carbon (lb)	0.560	Sheets, C.R., Stainless, 302 (lb)	0.658
Bars, Tool Steel, Alloy, Oil Hardening Die (lb)	0.680	Sheets, Electrical	12.625
Bars, Tool Steel, H.R. Alloy, High Speed, W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.060 (lb)	1.400	Strip, C.R., Carbon	9.489
Bars, Tool Steel, H.R. Alloy, High Speed, W18, Cr 4, V 1 (lb)	1.895	Strip, C.R., Stainless, 430 (lb)	0.480
Bars, H.R., Alloy	10.775	Strip, H.R., Carbon	6.250
Bars, H.R., Stainless, 303 (lb)	0.543	Pipe, Black, Buttweld (100 ft)	19.905
Bars, H.R., Carbon	6.675	Pipe, Galv., Buttweld (100 ft)	23.253
		Pipe, Line (100 ft)	199.530
		Casing, Oil Well, Carbon (100 ft)	201.080
		Casing, Oil Well, Alloy (100 ft)	315.213
Tubes, Boiler (100 ft)	51.200	Black Plate, Canmaking Quality (95 lb base box)	7.900
Tubing, Mechanical, Carbon (100 ft)	27.005	Wire, Drawn, Carbon	10.575
Tubing, Mechanical, Stainless, 304 (100 ft)	205.608	Wire, Drawn, Stainless, 430 (lb)	0.665
Tin Plate, Hot-dipped, 1.25 lb (95 lb base box)	10.100	Bale Ties (bundles)	7.967
Tin Plate, Electrolytic, 0.25 lb (95 lb base box)	8.800	Nails, Wire, 8d Common	9.825
		Wire, Barbed (80-rod spool)	8.722
		Woven Wire Fence (20-rod roll)	21.737

STEEL's FINISHED STEEL PRICE INDEX*

	May 27 1959	Week Ago	Month Ago	Year Ago	5 Yr Ago
Index (1935-39 avg=100)	247.82	247.82	247.82	239.15	189.75
Index in cents per lb	6.713	6.713	6.713	6.479	5.140

STEEL's ARITHMETICAL COMPOSITES*

Finished Steel, NT	$149.96	$149.96	$149.96	$145.42	$113.70
No. 2 Fdry, Pig Iron, GT	66.49	66.49	66.49	66.49	56.54
Basic Pig Iron, GT	65.99	65.99	65.99	65.99	56.04
Malleable Pig Iron, GT	67.27	67.27	67.27	67.27	57.27
Steelmaking Scrap, GT	33.67	33.33	34.33	34.50	28.17

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL

	May 27 1959	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bars, H.R., Pittsburgh	5.675	5.675	5.675	5.425	4.15
Bars, H.R., Chicago	5.675	5.675	5.675	5.425	4.15
Bars, H.R., deld., Philadelphia	5.975	5.975	5.975	5.725	4.405
Bars, C.F., Pittsburgh	7.65*	7.65*	7.65*	7.30*	5.20
Shapes, Std., Pittsburgh	5.50	5.50	5.50	5.275	4.10
Shapes, Std., Chicago	5.50	5.50	5.50	5.275	4.10
Shapes, deld., Philadelphia	5.77	5.77	5.77	5.545	4.38
Plates, Pittsburgh	5.30	5.30	5.30	5.10	4.10
Plates, Chicago	5.30	5.30	5.30	5.10	4.10
Plates, Coatesville, Pa.	5.30	5.30	5.30	5.10	4.10
Plates, Sparrows Point, Md.	5.30	5.30	5.30	5.10	4.10
Plates, Claymont, Del.	5.30	5.30	5.30	5.10	4.10
Sheets, H.R., Pittsburgh	5.10	5.10	5.10	4.925	3.925
Sheets, H.R., Chicago	5.10	5.10	5.10	4.925	3.925
Sheets, C.R., Pittsburgh	6.275	6.275	6.275	6.05	4.775
Sheets, C.R., Chicago	6.275	6.275	6.275	6.05	4.775
Sheets, C.R., Detroit	6.275	6.275	6.275	6.05-6.15	4.975
Sheets, Galv., Pittsburgh	6.875	6.875	6.875	6.60	5.275
Strip, H.R., Pittsburgh	5.10	5.10	5.10	4.925	4.425
Strip, H.R., Chicago	5.10	5.10	5.10	4.925	3.925
Strip, C.R., Pittsburgh	7.425	7.425	7.425	7.15	5.45
Strip, C.R., Chicago	7.425	7.425	7.425	7.15	5.70
Strip, C.R., Detroit	7.425	7.425	7.425	7.25	5.65
Wire, Basic, Pittsburgh	8.00	8.00	8.00	7.65	5.525
Nails, Wire, Pittsburgh	8.95	8.95	8.95	8.95	6.55
Tin plate(1.50 lb)box, Pitts.	$10.65	$10.65	$10.65	$10.30	$8.95

*Including 0.35c for special quality.

SEMIFINISHED STEEL

Billets, forging, Pitts. (NT)	$99.50	$99.50	$99.50	$96.00	$75.50
Wire rods 7/32-5/8" Pitts.	6.40	6.40	6.40	6.15	4.525

PIG IRON, Gross Ton

	May 27 1959	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bessemer, Pitts.	$67.00	$67.00	$67.00	$67.00	$57.00
Basic, Valley	66.00	66.00	66.00	66.00	56.00
Basic, deld., Phila.	70.41	70.41	70.41	70.41	59.66
No. 2 Fdry, NevilleIsland,Pa.	66.50	66.50	66.50	66.50	56.50
No. 2 Fdry, Chicago	66.50	66.50	66.50	66.50	56.50
No. 2 Fdry, deld., Phila.	70.91	70.91	70.91	70.91	60.16
No. 2 Fdry, Birm.	62.50	62.50	62.50	62.50	52.88
No. 2 Fdry(Birm.)deld., Cin.	70.20	70.20	70.20	70.20	60.43
Malleable, Valley	66.50	66.50	66.50	66.50	56.50
Malleable, Chicago	66.50	66.50	66.50	66.50	56.50
Ferromanganese, net ton†	245.00	245.00	245.00	245.00	200.00

†74-76% Mn, Duquesne, Pa.

SCRAP, Gross Ton (Including broker's commission)

No. 1 Heavy Melt, Pittsburgh	$34.50	$34.50	$36.50	$34.50	$30.50
No. 1 Heavy Melt, E. Pa.	33.50	33.50	33.50	34.50	23.00
No. 1 Heavy Melt, Chicago	34.00	32.00	33.00	34.50	32.00
No. 1 Heavy Melt, Valley	37.50	35.50	35.50	36.50	29.50
No. 1 Heavy Melt, Cleve.	35.50	33.50	33.50	33.00	28.50
No. 1 Heavy Melt, Buffalo	31.50	31.50	32.50	26.50	26.50
Rails, Rerolling, Chicago	57.50	55.50	57.50	53.50	44.00
No. 1 Cast, Chicago	49.50	47.50	45.50	41.50	38.50

COKE, Net Ton

Beehive, Furn., Connisvl.	$15.00	$15.00	$15.00	$15.25	$14.75
Beehive, Fdry., Connisvl.	18.25	18.25	18.25	18.25	16.75
Oven, Fdry., Milwaukee	32.00	32.00	32.00	30.50	25.25

Steel Prices

Mill prices as reported to STEEL, May 27, cents per pound except as otherwise noted. *Changes shown in italics.* Code number following mill point indicates producing company. Key to producers, page 129; footnotes; page 131.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)
Munhall,Pa. U5 ..... $76.00

INGOTS, Alloy (NT)
Detroit S41 ..... $82.00
Economy,Pa. B14 ..... 82.00
Farrell,Pa. S3 ..... 82.00
Lowellville,O S3 ..... 82.00
Midland,Pa. C18 ..... 82.00
Munhall,Pa. U5 ..... 82.00
Sharon,Pa. S3 ..... 82.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bartonville,Ill. K4 ..... $82.00
Bessemer,Pa. U5 ..... 80.00
Buffalo R2 ..... 80.00
Clairton,Pa. U5 ..... 80.00
Ensley,Ala. T2 ..... 80.00
Fairfield,Ala. T2 ..... 80.00
Fontana,Calif. K1 ..... 90.50
Gary,Ind. U5 ..... 80.00
Johnstown,Pa. B2 ..... 80.00
Lackawanna,N.Y. B2 ..... 80.00
Munhall,Pa. U5 ..... 80.00
Owensboro,Ky. G8 ..... 80.00
S.Chicago,Ill. R2, U5 ..... 80.00
S.Duquesne,Pa. U5 ..... 80.00
Sterling,Ill. N15 ..... 80.00
Youngstown R2 ..... 80.00

Carbon, Forging (NT)
Bessemer,Pa. U5 ..... $99.50
Buffalo R2 ..... 99.50
Canton,O. R2 ..... 102.00
Clairton,Pa. U5 ..... 99.50
Conshohocken,Pa. A3 ..... 104.50
Ensley,Ala. T2 ..... 99.50
Fairfield,Ala. T2 ..... 99.50
Farrell,Pa. S3 ..... 99.50
Fontana,Calif. K1 ..... 109.00
Gary,Ind. U5 ..... 99.50
Geneva,Utah C11 ..... 99.50
Houston S5 ..... 104.50
Johnstown,Pa. B2 ..... 99.50
Lackawanna,N.Y. B2 ..... 99.50
LosAngeles B3 ..... 109.00
Midland,Pa. C18 ..... 99.50
Munhall,Pa. U5 ..... 99.50
Owensboro,Ky. G8 ..... 99.50
Seattle B3 ..... 109.00
Sharon,Pa. S3 ..... 99.50
S.Chicago R2, U5, W14 ..... 99.50
S.Duquesne,Pa. U5 ..... 99.50
S.SanFrancisco B3 ..... 109.00
Warren,O. C17 ..... 99.50

Alloy, Forging (NT)
Bethlehem,Pa. B2 ..... $119.00
Bridgeport,Conn. C32 ..... 119.00
Buffalo R2 ..... 119.00
Canton,O. R2, T7 ..... 119.00
Conshohocken,Pa. A3 ..... 126.00
Detroit S41 ..... 119.00
Economy,Pa. B14 ..... 119.00
Farrell,Pa. S3 ..... 119.00
Fontana,Calif. K1 ..... 140.00
Gary,Ind. U5 ..... 119.00
Houston S5 ..... 124.00
Ind.Harbor,Ind. Y1 ..... 119.00
Johnstown,Pa. B2 ..... 119.00
Lackawanna,N.Y. B2 ..... 119.00
LosAngeles B3 ..... 139.00
Lowellville,O. S3 ..... 119.00
Massillon,O. R2 ..... 119.00
Midland,Pa. C18 ..... 119.00
Munhall,Pa. U5 ..... 119.00
Owensboro,Ky. G8 ..... 119.00
Sharon,Pa. S3 ..... 119.00
S.Chicago R2,U5,W14 ..... 119.00
S.Duquesne,Pa. U5 ..... 119.00
Struthers,O. Y1 ..... 119.00
Warren,O. C17 ..... 119.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 ..... $122.50
Canton,O. R2 ..... 125.00
Cleveland R2 ..... 122.50
Gary,Ind. U5 ..... 122.50
S.Chicago,Ill. R2, W14 ..... 122.50
S.Duquesne,Pa. U5 ..... 122.50
Warren,O. C17 ..... 122.50

SKELP
Aliquippa,Pa. J5 ..... 5.05
Munhall,Pa. U5 ..... 5.05
Pittsburgh J5 ..... 5.05
Warren,O. R2 ..... 5.05
Youngstown R2, U5 ..... 5.05

WIRE RODS
AlabamaCity,Ala. R2 ..... 6.40
Aliquippa,Pa. J5 ..... 6.40
Alton,Ill. L1 ..... 6.60
Bartonville,Ill. K4 ..... 6.50
Buffalo W12 ..... 6.40
Cleveland A7 ..... 6.40
Donora,Pa. A7 ..... 6.40
Fairfield,Ala. T2 ..... 6.40
Houston S5 ..... 6.65
IndianaHarbor,Ind. Y1.. 6.40
Johnstown,Pa. B2 ..... 6.40
Joliet,Ill. A7 ..... 6.40
KansasCity,Mo. S5 ..... 6.65
Kokomo,Ind. C16 ..... 6.50
LosAngeles B3 ..... 7.20
Minnequa,Colo. C10 ..... 6.65
Monessen,Pa. P7 ..... 6.40
N.Tonawanda,N.Y. B11 .. 6.40
Pittsburg,Calif. C11 ..... 7.20
Portsmouth,O. P12 ..... 6.40
Roebling,N.J. R5 ..... 6.50
S.Chicago,Ill. R2, W14 .. 6.40
SparrowsPoint,Md. B2 .. 6.50
Sterling,Ill.(1) N15 ..... 6.40
Sterling,Ill. N15 ..... 6.50
Struthers,O. Y1 ..... 6.40
Worcester,Mass. A7 ..... 6.70

STRUCTURALS

Carbon Steel Std. Shapes
AlabamaCity,Ala. R2 ..... 5.50
Aliquippa,Pa. J5 ..... 5.50
Atlanta A11 ..... 5.70
Bessemer,Ala. T2 ..... 5.50
Bethlehem,Pa. B2 ..... 5.55
Birmingham C15 ..... 5.50
Clairton Pa. U5 ..... 5.50
Fairfield,Ala. T2 ..... 5.50
Fontana,Calif. K1 ..... 6.30
Gary,Ind. U5 ..... 5.50
Geneva,Utah C11 ..... 5.50
Houston S5 ..... 5.60
Ind.Harbor,Ind. I-2, Y1 5.50
Johnstown,Pa. B2 ..... 5.55
Joliet,Ill. P22 ..... 5.50
KansasCity,Mo. S5 ..... 5.60
Lackawanna,N.Y. B2 ..... 5.55
LosAngeles B3 ..... 6.20
Minnequa,Colo. C10 ..... 5.80
Munhall,Pa. U5 ..... 5.50
Niles,Calif. P1 ..... 6.25
Phoenixville,Pa. P1 ..... 5.55
Portland,Oreg. O4 ..... 6.25
Seattle B3 ..... 6.25
S.Chicago,Ill. U5, W14 .. 5.50
S.SanFrancisco B3 ..... 6.15
Sterling,Ill. N15 ..... 5.50
Torrance,Calif. C11 ..... 6.20
Weirton,W.Va. W6 ..... 5.50

Wide Flange
Bethlehem,Pa. B2 ..... 5.55
Clairton,Pa. U5 ..... 5.50
Fontana,Calif. K1 ..... 6.45
IndianaHarbor,Ind. I-2 .. 5.50
Lackawanna,N.Y. B2 ..... 5.55
Munhall,Pa. U5 ..... 5.50
Phoenixville,Pa. P4 ..... 5.55
S.Chicago,Ill. U5 ..... 5.50
Sterling,Ill. N15 ..... 5.50
Weirton,W.Va. W6 ..... 5.50

Alloy Std. Shapes
Aliquippa,Pa. J5 ..... 6.80
Clairton,Pa. U5 ..... 6.80
Gary,Ind. U5 ..... 6.80
Houston S5 ..... 6.90
Munhall,Pa. U5 ..... 6.80
S.Chicago,Ill. U5, W14.. 6.80

H.S., L.A., Std. Shapes
Aliquippa,Pa. J5 ..... 8.05
Bessemer,Ala. T2 ..... 8.05
Bethlehem,Pa. B2 ..... 8.10
Clairton,Pa. U5 ..... 8.05
Fairfield,Ala. T2 ..... 8.05
Fontana,Calif. K1 ..... 8.85
Gary,Ind. U5 ..... 8.05
Geneva,Utah C11 ..... 8.05
Houston S5 ..... 8.15
Ind.Harbor,Ind. I-2, Y1 8.05
Johnstown,Pa. B2 ..... 8.10
KansasCity,Mo. S5 ..... 8.15
Lackawanna,N.Y. B2 ..... 8.10
LosAngeles B3 ..... 8.75
Munhall,Pa. U5 ..... 8.05
Seattle B3 ..... 8.80
S.Chicago,Ill. U5, W14.. 8.05
S.SanFrancisco B3 ..... 8.70
Sterling,Ill. N15 ..... 7.75
Struthers,O. Y1 ..... 8.05

H.S., L.A., Wide Flange
Bethlehem,Pa. B2 ..... 8.10
Ind.Harbor,Ind. I-2 ..... 8.05
Lackawanna,N.Y. B2 ..... 8.10
Munhall,Pa. U5 ..... 8.05
S.Chicago,Ill. U5 ..... 8.05
Sterling,Ill. N15 ..... 7.75

PILING

BEARING PILES
Bethlehem,Pa. B2 ..... 5.55
Ind.Harbor,Ind. I-2 ..... 5.50
Lackawanna,N.Y. B2 ..... 5.55
Munhall,Pa. U5 ..... 5.50
S.Chicago, Ill. I-2, U5 .. 5.50

STEEL SHEET PILING
Ind.Harbor,Ind. I-2 ..... 6.50
Lackawanna,N.Y. B2 ..... 6.50
Munhall,Pa. U5 ..... 6.50
S.Chicago,Ill. I-2, U5 .. 6.50
Weirton,W.Va. W6 ..... 6.50

PLATES

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ..... 5.30
Aliquippa,Pa. J5 ..... 5.30
Ashland,Ky.(15) A10 ..... 5.30
Atlanta A11 ..... 5.50
Bessemer,Ala. T2 ..... 5.30
Clairton,Pa. U5 ..... 5.30
Claymont,Del. C22 ..... 5.30
Cleveland J5, R2 ..... 5.30
Coatesville,Pa. L7 ..... 5.30
Conshohocken,Pa. A3 ..... 5.30
Ecorse,Mich. G5 ..... 5.30
Fairfield,Ala. T2 ..... 5.30
Farrell,Pa. S3 ..... 5.30
Fontana,Calif.(30) K1 ..... 6.10
Gary,Ind. U5 ..... 5.30
Geneva,Utah C11 ..... 5.30
GraniteCity,Ill. G4 ..... 5.40
Harrisburg,Pa. P4 ..... 5.30
Houston S5 ..... 5.40
Ind.Harbor,Ind. I-2, Y1.. 5.30
Johnstown,Pa. B2 ..... 5.30
Lackawanna,N.Y. B2 ..... 5.30
Mansfield,O. E6 ..... 5.30
Minnequa,Colo. C10 ..... 6.15
Munhall,Pa. U5 ..... 5.30
Newport,Ky. A2 ..... 5.30
Pittsburgh J5 ..... 5.30
Riverdale,Ill. A1 ..... 5.30
Seattle B3 ..... 6.20
Sharon,Pa. S3 ..... 5.30
S.Chicago Ill. U5, W14.. 5.30
SparrowsPoint,Md. B2 .. 5.30
Sterling,Ill. N15 ..... 5.30
Steubenville,O. W10 ..... 5.30
Warren,O. R2 ..... 5.30
Youngstown U5, Y1 ..... 5.30
Youngstown (27) R2 ..... 5.30

PLATES, Carbon Abras. Resist.
Claymont,Del. C22 ..... 7.05
Fontana,Calif. K1 ..... 7.85
Geneva,Utah C11 ..... 7.05
Houston S5 ..... 7.15
Johnstown,Pa. B2 ..... 7.05
SparrowsPoint,Md. B2 .. 7.05

PLATES, Wrought Iron
Economy,Pa. B14 ..... 13.55

PLATES, H.S., L.A.
Aliquippa,Pa. J5 ..... 7.95
Ashland Ky. A10 ..... 7.95
Bessemer,Ala. T2 ..... 7.95
Clairton,Pa. U5 ..... 7.95
Claymont,Del. C22 ..... 7.95
Cleveland J5, R2 ..... 7.95
Coatesville,Pa. L7 ..... 7.95
Conshohocken,Pa. A3 .. 7.95
Economy,Pa. B14 ..... 7.95
Ecorse,Mich. G5 ..... 7.95
Fairfield,Ala. T2 ..... 7.95
Farrell,Pa. S3 ..... 7.95
Fontana,Calif.(30) K1 .. 8.75
Gary,Ind. U5 ..... 7.95
Geneva,Utah C11 ..... 7.95
Houston S5 ..... 8.05
Ind.Harbor,Ind. I-2, Y1. 7.95
Johnstown,Pa. B2 ..... 7.95
Munhall,Pa. U5 ..... 7.95
Pittsburgh J5 ..... 7.95
Seattle B3 ..... 8.85
Sharon,Pa. S3 ..... 7.95
S.Chicago,Ill. U5, W14 .. 7.95
SparrowsPoint,Md. B2 .. 7.95
Warren,O. R2 ..... 7.95
Youngstown U5, Y1 ..... 7.95

PLATES, Alloy
Aliquippa,Pa. J5 ..... 7.50
Claymont,Del. C22 ..... 7.50
Coatesville,Pa. L7 ..... 7.50
Economy,Pa. B14 ..... 7.50
Farrell,Pa. S3 ..... 7.50
Fontana,Calif. K1 ..... 8.30
Gary,Ind. U5 ..... 7.50
Houston S5 ..... 7.60
Ind.Harbor,Ind. Y1 ..... 7.50
Johnstown,Pa. B2 ..... 7.50
Lowellville,O. S3 ..... 7.50
Munhall,Pa. U5 ..... 7.50
Newport,Ky. A2 ..... 7.50
Pittsburgh J5 ..... 7.50
Seattle B3 ..... 8.40
Sharon,Pa. S3 ..... 7.50
S.Chicago,Ill. U5, W14.. 7.50
SparrowsPoint,Md. B2 .. 7.50
Youngstown Y1 ..... 7.50

FLOOR PLATES
Cleveland J5 ..... 6.375
Conshohocken,Pa. A3 .. 6.375
Ind.Harbor,Ind. I-2 .. 6.375
Munhall,Pa. U5 ..... 6.375
Pittsburgh J5 ..... 6.375
S.Chicago,Ill. U5 ..... 6.375

PLATES, Ingot Iron
Ashland c.l.(15) A10 .. 5.55
Ashland l.c.l.(15) A10 .. 6.05
Cleveland c.l. R2 ..... 6.05
Warren,O. c.l. R2 ..... 6.05

BARS

BARS, Hot-Rolled Carbon (Merchant Quality)
Ala.City,Ala.(9) R2 ..... 5.675
Aliquippa,Pa. (9) J5 ..... 5.675
Alton,Ill. L1 ..... 5.875
Atlanta(9) A11 ..... 5.875
Bessemer,Ala.(9) T2 ..... 5.675
Birmingham(9) C15 ..... 5.675
Buffalo(9) R2 ..... 5.675
Canton,O. (23) R2 ..... 6.15
Clairton,Pa.(9) U5 ..... 5.675
Cleveland(9) R2 ..... 5.675
Ecorse,Mich.(9) G5 ..... 5.675
Emeryville,Calif. J7 ..... 6.425
Fairfield,Ala.(9) T2 ..... 5.675
Fairless,Pa.(9) U5 ..... 5.825
Fontana,Calif.(9) K1 ..... 6.375
Gary,Ind.(9) U5 ..... 5.675
Houston(9) S5 ..... 5.925
Ind.Harbor(9) I-2, Y1.. 5.675
Johnstown,Pa.(9) B2 ..... 5.675
Joliet,Ill. P22 ..... 5.675
KansasCity,Mo.(9) S5.. 5.925
Lackawanna(9) B2 ..... 5.675
LosAngeles(9) B3 ..... 6.375
Massillon,O. (23) R2 ..... 6.15
Midland,Pa.(23) C18 ..... 6.025
Milton,Pa. M18 ..... 5.825
Minnequa,Colo. C10 ..... 6.125
Niles,Calif. P1 ..... 6.375
N.Tonawanda,N.Y.(23)B11 6.025
Owensboro,Ky.(9) G8 ..... 6.025
Pittsburg,Calif.(9) C11 .. 6.375
Pittsburgh(9) J5 ..... 5.675
Portland,Oreg. O4 ..... 6.425
Riverdale,Ill.(9) A1 ..... 5.675
Seattle A24, B3, N14 ..... 6.425
S.Ch'c'go(9)R2,U5,W14 .. 5.675
S.Duquesne,Pa.(9) U5.. 5.675
S.SanFran.,Calif.(9)B3 .. 6.425
Sterling,Ill.(1)(9) N15.. 5.675
Sterling,Ill.(9) N15 ..... 5.775
Struthers,O.(9) Y1 ..... 5.675
Tonawanda,N.Y. B12 ..... 5.675
Torrance,Calif.(9) C11.. 6.375
Warren,O. C17 ..... 6.025
Youngstown(9) R2, U5.. 5.675

BARS, Hot-Rolled Alloy
Aliquippa,Pa. J5 ..... 6.725
Bethlehem,Pa. B2 ..... 6.725
Bridgeport,Conn. C32 .. 6.80
Buffalo R2 ..... 6.725
Canton,O. R2, T7 ..... 6.725
Clairton,Pa. U5 ..... 6.725
Detroit S41 ..... 6.725
Economy,Pa. B14 ..... 6.725
Ecorse,Mich. G5 ..... 6.725
Fairless,Pa. U5 ..... 6.875
Farrell,Pa. S3 ..... 6.725
Fontana,Calif. K1 ..... 7.775
Gary,Ind. U5 ..... 6.725
Houston S5 ..... 6.975
Ind.Harbor,Ind. I-2, Y1.. 6.725
Johnstown,Pa. B2 ..... 6.725
KansasCityMo. S5 ..... 6.975
Lackawanna,N.Y. B2 .. 6.725
LosAngeles B3 ..... 7.775
Lowellville,O. S3 ..... 6.725
Massillon,O. R2 ..... 6.725
Midland,Pa. C18 ..... 6.725
Owensboro,Ky. G8 ..... 6.725
Pittsburgh J5 ..... 6.725
Sharon,Pa. S3 ..... 6.725
S.Chicago R2, U5, W14 6.725
S.Duquesne,Pa. U5 .... 6.725
Struthers,O. Y1 ..... 6.725
Warren,O. C17 ..... 6.725
Youngstown U5 ..... 6.725

BARS & SMALL SHAPES, H.R. High-Strength, Low-Alloy
Aliquippa,Pa. J5 ..... 8.30
Bessemer,Ala. T2 ..... 8.30
Bethlehem,Pa. B2 ..... 8.30
Clairton,Pa. U5 ..... 8.30
Cleveland R2 ..... 8.30
Ecorse,Mich. G5 ..... 8.30
Fairfield,Ala. T2 ..... 8.30
Fontana,Calif. K1 ..... 9.00
Gary,Ind. U5 ..... 8.30
Houston S5 ..... 8.55
Ind.Harbor,Ind. Y1 ..... 8.30
Johnstown,Pa. B2 ..... 8.30
KansasCity,Mo. S5 ..... 8.55
Lackawanna,N.Y. B2 .. 8.30
LosAngeles B3 ..... 9.00
Pittsburgh J5 ..... 8.30
Seattle B3 ..... 9.05
S.Chicago,Ill. R2, W14.. 8.30
S.Duquesne,Pa. U5 .... 8.30
S.SanFrancisco B3 ..... 9.05
Struthers,O. Y1 ..... 8.30
Youngstown U5 ..... 8.30

BAR SIZE ANGLES; H.R. Carbon
Bethlehem,Pa.(9) B2 ..... 5.825
Houston(9) S5 ..... 5.925
KansasCity,Mo.(9)S5 ..... 5.925
Lackawanna(9) B2 ..... 5.675
Sterling,Ill. N15 ..... 5.775
Sterling,Ill.(1) N15 ..... 5.675
Tonawanda,N.Y. B12 ..... 5.675

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 ..... 5.675
Atlanta A11 ..... 5.875
Joliet,Ill. P22 ..... 5.675
Minnequa,Colo. C10 ..... 6.125
Niles,Calif. P1 ..... 6.375
Pittsburgh J5 ..... 5.675
Portland,Oreg. O4 ..... 6.425
SanFrancisco S7 ..... 6.52
Seattle B3 ..... 6.425

BAR SHAPES, Hot-Rolled Alloy
Aliquippa,Pa. J5 ..... 6.80
Clairton,Pa. U5 ..... 6.80
Gary,Ind. U5 ..... 6.80
Houston S5 ..... 7.05
KansasCity,Mo. S5 ..... 7.05
Pittsburgh J5 ..... 6.80
Youngstown U5 ..... 6.80

BARS, C.F. Leaded (Including leaded extra) Carbon
LosAngeles P2, S30 .. 11.75*

Alloy
Ambridge,Pa. W18 .... 10.175
BeaverFalls,Pa. M12 .. 10.175
Camden,N.J. P13 .... 10.35
Chicago W18 ..... 10.175
Elyria,O. W8 ..... 10.175
Monaca,Pa. S17 ..... 10.175
Newark,N.J. W18 .... 10.35
SpringCity,Pa. K3 .... 10.35

*Grade A; add 0.05c for Grade B.

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 .... 7.65
BeaverFalls,Pa. M12,R2 7.65
Birmingham C15 ..... 8.25
Buffalo B5 ..... 7.70
Camden,N.J. P13 ..... 8.10
Carnegie,Pa. C12 ..... 7.65
Chicago W18 ..... 7.65
Cleveland A7, C20 ..... 7.65
Detroit B5, P17 ..... 7.85
Detroit S41 ..... 7.65
Donora,Pa. A7 ..... 7.65
Elyria,O. W8 ..... 7.65
FranklinPark,Ill. N5 .. 7.65
Gary,Ind. R2 ..... 7.65
GreenBay,Wis. F7 ..... 7.65
Hammond I. L2 .. 7.65
Hartford,Co. R2 .... 8.15
Harvey,Ill. B5 ..... 7.65
LosAngeles(49) S30 .... 9.10
LosAngeles(49) P2, R2 9.10
Mansfield,Mass. B2 .... 8.20
Massillon,O. R2, R8 .... 7.65
Midland,Pa. C18 ..... 7.65
Monaca,Pa. S17 ..... 7.65
Newark,N.J. W18 ..... 8.10
NewCastle,Pa.(17) B4 .. 7.65
Pittsburgh J5 ..... 7.65
Plymouth,Mich. P5 .... 7.90
Putnam,Conn. W18 .... 8.20
Readville,Mass. C14 .... 8.20
S.Chicago,Ill. W14 .... 7.65
SpringCity,Pa. K3 .... 8.10
Struthers,O. Y1 ..... 7.65
Warren,O. C17 ..... 7.65
Waukegan,Ill. A7 ..... 7.65
Willimantic,Conn. J5 .... 8.15
Youngstown F3, Y1 .... 7.65

BARS, Cold-Finished Carbon (Turned and Ground)
Cumberland,Md.(5) C19 6.55

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 .... 9.025
BeaverFalls,Pa.M12,R2 9.025
Bethlehem,Pa. B2 .... 9.025
Bridgeport,Conn. C32.. 9.175
Buffalo B5 ..... 9.025
Camden,N.J. P13 ..... 9.20
Canton,O. T7 ..... 9.025
Carnegie,Pa. C12 ..... 9.025
Chicago W18 ..... 9.025
Cleveland A7, C20 ..... 9.025
Detroit B5, P17 ..... 9.225
Detroit S41 ..... 9.025
Donora,Pa. A7 ..... 9.025
Elyria,O. W8 ..... 9.025
FranklinPark,Ill. N5 .. 9.025
Gary,Ind. R2 ..... 9.025
GreenBay,Wis. F7 .... 9.025
Hammond,Ind. J5, L2.. 9.025
Hartford,Conn. R2 .... 9.325
Harvey,Ill. B5 ..... 9.025
Lackawanna,N.Y. B2 .. 9.025
LosAngeles P2, S30 .. 11.00
Mansfield,Mass. B5 .. 9.325
Massillon,O. R2, R8 .. 9.025
Midland,Pa. C18 ..... 9.025
Monaca,Pa. S17 ..... 9.025
Newark,N.J. W18 ..... 9.20
Plymouth,Mich. P5 .... 9.225
S.Chicago, Ill. W14 .. 9.025
SpringCity,Pa. K3 .... 9.20
Struthers,O. Y1 ..... 9.025
Warren,O. C17 ..... 9.025
Waukegan,Ill. A7 .... 9.025
Willimantic,Conn. J5 .. 9.325
Worcester,Mass. A7 .. 9.325
Youngstown F3, Y1 .... 9.025

BARS, Reinforcing, Billet (To Fabricators)

AlabamaCity,Ala. R2 ..5.675
Atlanta A11 .....5.675
Birmingham C15 .....5.675
Buffalo R2 .....5.675
Cleveland R2 .....5.675
Ecorse,Mich. G5 .....5.675
Emeryville,Calif. J7 ..6.425
Fairfield,Ala. T2 .....5.675
Fairless,Pa. U5 .....5.825
Fontana,Calif. K1 ....6.375
Ft.Worth,Tex(4)(26)T4 5.925
Gary,Ind. U5 .....5.675
Houston S5 .....5.925
Ind.Harbor,Ind. I-2, Y1 5.675
Johnstown,Pa. B2 ....5.675
Joliet,Ill. P22 .....5.675
KansasCity,Mo. S5 ...5.925
Kokomo,Ind. C16 ....5.775
Lackawanna,N.Y. B2 ..5.675
LosAngeles B3 .....6.375
Madison,Ill. L1 .....5.875
Milton,Pa. M18 .....5.825
Minnequa,Colo. C10 ..6.125
Niles,Calif. P1 .....6.375
Pittsburg,Calif. C11 ..6.375
Pittsburgh J5 .....5.675
Portland,Oreg. O4 ....6.425
SandSprings,Okla. S5 ..5.925
Seattle A24, B3, N14 ..6.425
S.Chicago,Ill. R2, W14 5.675
S.Duquesne,Pa. U5 ...5.675
S.SanFrancisco B3 ....6.425
SparrowsPoint,Md. B2..5.675
Sterling,Ill.(1) N15 ...5.675
Sterling,Ill. N15 .....5.775
Struthers,O. Y1 .....5.675
Tonawanda,N.Y. B12 ..6.10
Torrance,Calif. C11 ..6.375
Youngstown R2, U5 ..5.675

BARS, Reinforcing, Billet (Fabricated; To Consumers)

Baltimore B2 .....7.42
Boston B2, U8 .....8.15
Chicago U8 .....7.41
Cleveland U8 .....7.39
Houston S5 .....7.60
Johnstown,Pa. B2 ....7.33
KansasCity,Mo. S5 ...7.60
Lackawanna,N.Y. B2 ..7.35
Marion,O. P11 .....6.70
Newark,N.J. U8 .....7.80
Philadelphia U8 .....7.63
Pittsburgh J5, U8 ....7.35
SandSprings,Okla. S5 ..7.60
Seattle A24, B3, N14 ..7.95
SparrowsPt.,Md. B2 ..7.33
St.Paul U8 .....8.17
Williamsport,Pa. S19 ..7.25

BARS, Wrought Iron

Economy,Pa.(S.R.)B14 14.90
Economy,Pa.(D.R.)B14 18.55
Economy(Staybolt) B14 19.00
McK.Rks.(S.R.) L5 ..14.50
McK.Rks.(D.R.) L5 ..19.80
McK.Rks.(Staybolt)L5 20.95

BARS, Rail Steel

ChicagoHts.(3) C2, I-2 5.575
ChicagoHts.(4) (44) I-2 5.675
ChicagoHts.(4) C2 ...5.675
Franklin,Pa. (3) F5 ..5.575
Franklin,Pa. (4)F5 ..5.675
JerseyShore,Pa.(3) J8 ..5.55
Marion,O.(3) P11 ....5.575
Tonawanda(3) B12 ..5.575
Tonawanda(4) B12 ...6.10

SHEETS

SHEETS, Hot-Rolled Steel (18 Gage and Heavier)

AlabamaCity,Ala. R2 ..5.10
Allenport,Pa. P7 .....5.10
Aliquippa,Pa. J5 .....5.10
Ashland,Ky.(8) A10 ..5.10
Cleveland J5, R2 .....5.10
Conshohocken,Pa. A3 ..5.15
Detroit(8) M1 .....5.10
Ecorse,Mich. G5 .....5.10
Fairfield,Ala. T2 .....5.10
Fairless,Pa. U5 .....5.15
Farrell,Pa. S3 .....5.10
Fontana,Calif. K1 ....5.825
Gary,Ind. U5 .....5.10
Geneva,Utah C11 .....5.20
GraniteCity,Ill.(8) G4 ..5.20
Ind.Harbor,Ind. I-2, Y1.5.10
Irvin,Pa. U5 .....5.10
Lackawanna,N.Y. B2 ..5.10
Mansfield,O. E6 .....5.10
Munhall,Pa. U5 .....5.10
Newport,Ky. A2 .....5.10
Niles,O. M21, S3 .....5.10
Pittsburg,Calif. C11 ....5.80
Pittsburgh J5 .....5.10
Portsmouth,O. P12 ....5.10
Riverdale,Ill. A1 .....5.10
Sharon,Pa. S3 .....5.10
S.Chicago,Ill. U5, W14..5.10
SparrowsPoint,Md. B2 ..5.10
Steubenville,O. W10 ....5.10
Warren,O. R2 .....5.10
Weirton,W.Va. W6 ....5.10
Youngstown U5, Y1 ....5.10

SHEETS, H.R. (19 Ga. & Lighter)

Niles,O. M21, S3 ....6.275

SHEETS, H.R., Alloy

Gary,Ind. U5 .....8.40
Ind.Harbor,Ind. Y1 ....8.40
Irvin,Pa. U5 .....8.40
Munhall,Pa. U5 .....8.40
Newport,Ky. A2 .....8.40
Youngstown U5, Y1 ....8.40

SHEETS, H.R. (14 Ga. & Heavier) High-Strength, Low-Alloy

Aliquippa,Pa. J5 ....7.525
Ashland,Ky. A10 ....7.525
Cleveland J5, R2 ....7.525
Conshohocken,Pa. A3 ..7.575
Ecorse,Mich. G5 .....7.525
Fairfield,Ala. T2 ....7.525
Fairless,Pa. U5 .....7.575
Farrell,Pa. S3 .....7.525
Fontana,Calif. K1 ....8.25
Gary,Ind. U5 .....7.525
Ind.Harbor,Ind. I-2, Y1 7.525
Irvin,Pa. U5 .....7.525
Lackawanna(35) B2 ..7.525
Munhall,Pa. U5 .....7.525
Niles,O. S3 .....7.525
Pittsburgh J5 .....7.525
S.Chicago,Ill. U5, W14 7.525
Sharon,Pa. S3 .....7.525
SparrowsPoint(36) B2..7.525
Warren,O. R2 .....7.525
Weirton,W.Va. W6 ....7.525
Youngstown U5, Y1 ..7.525

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10 ...5.35
Cleveland R2 .....5.875
Warren,O. R2 .....5.875

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 .....7.05
Middletown,O. A10 ....6.775
Warren,O. R2 .....7.05

SHEETS, Cold-Rolled Steel (Commercial Quality)

AlabamaCity,Ala. R2 .6.275
Allenport,Pa. P7 .....6.275
Aliquippa,Pa. J5 .....6.275
Cleveland J5, R2 .....6.275
Conshohocken,Pa. A3 ..6.325
Detroit M1 .....6.275
Ecorse,Mich. G5 .....6.275
Fairfield,Ala. T2 .....6.275
Fairless,Pa. U5 .....6.325
Follansbee,W.Va. F4 ..6.275
Fontana,Calif. K1 ....7.40
Gary,Ind. U5 .....6.275
GraniteCity,Ill. G4 ....6.375
Ind.Harbor,Ind. I-2, Y1 6.275
Irvin,Pa. U5 .....6.275
Lackawanna,N.Y. B2..6.275
Mansfield,O. E6 .....6.275
Middletown,O. A10 ....6.275
Newport,Ky. A2 .....6.275
Pittsburg,Calif. C11 ..7.225
Pittsburgh J5 .....6.275
Portsmouth,O. P12 ....6.275
SparrowsPoint,Md. B2.6.275
Steubenville,O. W10 ..6.275
Warren,O. R2 .....6.275
Weirton,W.Va. W6 ....6.275
Yorkville,O. W10 .....6.275
Youngstown Y1 .....6.275

SHEETS, Cold-Rolled, High-Strength, Low-Alloy

Aliquippa,Pa. J5 ....9.275
Cleveland J5, R2 ....9.275
Ecorse,Mich. G5 .....9.275
Fairless,Pa. U5 .....9.325
Fontana,Calif. K1 ....10.40
Gary,Ind. U5 .....9.275
Ind.Harbor,Ind. I-2, Y1 9.275
Lackawanna(37) B2 ..9.275
Pittsburgh J5 .....9.275
SparrowsPoint(38) B2..9.275
Warren,O. R2 .....9.275
Weirton,W.Va. W6 ...9.275
Youngstown Y1 .....9.275

SHEETS, Culvert

	Cu Steel	Cu Fe
Ala.City,Ala. R2	7.225	....
Ashland,Ky. A10	7.225	7.475
Canton,O. R2	7.225	7.75
Fairfield T2	7.225	7.475
Gary,Ind. U5	7.225	7.475
GraniteCity,Ill.G4	7.325	....
Ind.Harbor I-2	7.225	7.475
Irvin,Pa. U5	7.225	7.475
Kokomo,Ind. C16	7.325	....
MartinsFry. W10	7.225	7.475
Pitts.,Calif. C11	7.975	....
Pittsburgh J5	7.225	....
SparrowsPt. B2	7.225	....

SHEETS, Culvert—Pure Iron

Ind.Harbor,Ind. I-2 ...7.475

SHEETS, Galvanized Steel Hot-Dipped

AlabamaCity,Ala. R2 .6.875‡
Ashland,Ky. A10 ...6.875†
Canton,O. R2 .....6.875‡
Dover,O. E6 .....6.875†
Fairfield,Ala. T2 ....6.875†
Gary,Ind. U5 .....6.875*
GraniteCity,Ill. G4 ....6.975*
Ind.Harbor,Ind. I-2 ...6.875†
Irvin,Pa. U5 .....6.875†
Kokomo,Ind. C16 ....6.975‡
MartinsFerry,O. W10 6.875*
Middletown,O. A10 ...6.875†
Pittsburg,Calif. C11 ..7.625*
Pittsburgh J5 .....6.875†
SparrowsPt.,Md. B2 ..6.875†
Warren,O. R2 .....6.875†
Weirton,W.Va. W6 ...6.875*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Well Casing

Fontana,Calif. K1 ....7.325

SHEETS, Galvanized High-Strength, Low-Alloy

Irvin,Pa. U5 .....10.125
Pittsburgh J5 .....10.125
SparrowsPt.(39) B2 ..10.025

SHEETS, Galvannealed Steel

Canton,O. R2 .....7.275
Irvin,Pa. U5 .....7.275

SHEETS, Galvanized Ingot Iron (Hot-Dipped Continuous)

Ashland,Ky. A10 ....7.125
Middletown,O. A10 ....7.125

SHEETS, Electrogalvanized

Cleveland(28) B2 .....7.65
Niles,O.(28) R2 .....7.65
Weirton,W.Va. W6 ....7.50
Youngstown J5 .....7.50

SHEETS, Aluminum Coated

Butler,Pa. A10 (type 1) 9.525
Butler,Pa. A10 (type 2) 9.625

SHEETS, Enameling Iron

Ashland,Ky. A10 ....6.775
Cleveland R2 .....6.775
Fairfield,Ala. T2 ....6.775
Gary,Ind. U5 .....6.775
GraniteCity,Ill. G4 ....6.875
Ind.Harbor,Ind. I-2, Y1 6.775
Irvin,Pa. U5 .....6.775
Middletown,O. A10 ....6.775
Niles,O. M21, S3 .....6.775
Youngstown Y1 .....6.775

BLUED STOCK, 29 Gage

Dover,O. E6 .....8.70
Follansbee,W.Va. F4 ...8.70
Ind.Harbor,Ind. I-2 ....8.70
Mansfield,O. E6 .....8.70
Warren,O. R2 .....8.70
Yorkville,O. W10 .....8.70

SHEETS, Long Terne, Steel (Commercial Quality)

BeechBottom,W.Va.W10 7.225
Gary,Ind. U5 .....7.225
Mansfield,O. E6 .....7.225
Middletown,O. A10 ....7.225
Niles,O. M21, S3 .....7.225
Warren,O. R2 .....7.225
Weirton,W.Va. W6 ....7.225

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 ....7.625

Key To Producers

A1 Acme Steel Co.
A2 Acme-Newport Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Div., H. K. Porter Co. Inc.
A6 American Shim Steel Co.
A7 American Steel & Wire Div., U. S. Steel Corp.
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A24 Alaska Steel Mills Inc.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel Div., U. S. Steel Corp.
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div., H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Plant, Wickwire Spencer Steel Div., Colo. Fuel & Iron
C23 Charter Wire Inc.

C24 G. O. Carlson Inc.
C32 Carpenter Steel of N.Eng.
D2 Detroit Steel Corp.
D4 Disston Div., H. K. Porter Co. Inc.
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E5 Elliott Bros. Steel Co.
E6 Empire-Reeves Steel Corp.
E10 Enamel Prod. & Plating

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.
G8 Green River Steel Corp.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins Steel Tube Works
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L6 Lone Star Steel Co.
L7 Lukens Steel Co.
L8 Leschen Wire Rope Div., H. K. Porter Co. Inc.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M14 McInnes Steel Co.
M16 Md. Fine & Specialty Wire Co. Inc.
M17 Metal Forming Corp.
M18 Milton Steel Div., Merritt-Chapman&Scott
M21 Mallory-Sharon Metals Corp.
M22 Mill Strip Products Co.

N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div., U. S. Steel Corp.
N5 Nelsen Steel & Wire Co.
N6 New England High Carbon Wire Co.
N8 Newman-Crosby Steel
N14 Northwest. Steel Rolling Mills Inc.
N15 Northwestern S.&W. Co.
N20 Neville Ferro Alloy Co.

O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Steel Corp.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke&Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Div., Detroit Steel Corp.
P13 Precision Drawn Steel
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., American Chain & Cable
P17 Plymouth Steel Corp.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.
P24 Phil. Steel & Wire Corp.

R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R8 Reliance Div., Eaton Mfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Div., Copperweld Steel Co.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Prod.
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
S40 Seneca Steel Service
S41 Stainless & Strip Div., J&L Steel Corp.
S42 Southern Elec. Steel Co.
S43 Seymour Mfg. Co.
S44 Screw & Bolt Corp. of America
T2 Tenn. Coal & Iron Div., U. S. Steel Corp.
T3 Tenn. Products & Chemical Corp.
T4 Texas Steel Co.
T5 Thomas Strip Div., Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
T13 Tube Methods Inc.
T19 Techalloy Co. Inc.

U3 Union Wire Rope Corp.
U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U. S. Steel Supply Div., U. S. Steel Corp.
U11 Union Carbide Metals Co.
U13 Union Steel Corp.

V2 Vanadium-Alloys Steel
V3 Vulcan-Kidd Steel Div., H. K. Porter Co.

W1 Wallace Barnes Steel Div., Associated Spring Corp.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W8 Western Automatic Machine Screw Co.
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.

Y1 Youngstown Sheet & Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2 ...5.10
Allenport,Pa. P7 .....5.10
Alton,Ill. L1 .....5.30
Ashland,Ky.(8) A10 ....5.10
Atlanta A11 .....5.10
Bessemer,Ala. T2 .....5.10
Birmingham C15 .....5.10
Buffalo(27) R2 .....5.10
Conshohocken,Pa. A3 ..5.15
Detroit M1 .....5.10
Ecorse,Mich. G5 .....5.10
Fairfield,Ala. T2 .....5.10
Farrell,Pa. S3 .....5.10
Fontana,Calif. K1 ....5.825
Gary,Ind. U5 .....5.10
Ind.Harbor,Ind. I-2, Y1..5.10
Johnstown,Pa.(25) B2 ..5.10
Lackaw'na,N.Y.(25) B2.5.10
LosAngeles(25) B3 .....5.85
LosAngeles C1 .....8.60
Minnequa,Colo. C10 ....6.20
Riverdale,Ill. A1 .....5.10
SanFrancisco S7 .....6.60
Seattle(25) B3 .....6.10
Seattle N14 .....6.60
Sharon,Pa. S3 .....5.10
S.Chicago W14 .....5.10
S.SanFrancisco(25) B3..5.85
SparrowsPoint,Md. B2 ..5.10
Torrance,Calif. C11 ....5.85
Warren,O. R2 .....5.10
Weirton,W.Va. W6 .....5.10
Youngstown U5 .....5.10

STRIP, Hot-Rolled Alloy

Carnegie,Pa. S18 .....8.40
Farrell,Pa. S3 .....8.40
Gary,Ind. U5 .....8.40
Houston S5 .....8.65
Ind.Harbor,Ind. Y1 ....8.40
KansasCity,Mo. S5 .....8.65
LosAngeles B3 .....9.60
Lowellville,O. S3 .....8.40
Newport,Ky. A2 .....8.40
Sharon,Pa. A2, S3 .....8.40
S.Chicago,Ill. W14 .....8.40
Youngstown U5, Y1 ....8.40

STRIP, Hot-Rolled High-Strength, Low-Alloy

Ashland,Ky. A10 .....7.575
Bessemer,Ala. T2 .....7.575
Conshohocken,Pa. A3 ..7.575
Ecorse,Mich. G5 .....7.575
Fairfield,Ala. T2 .....7.575
Farrell,Pa. S3 .....7.575
Gary,Ind. U5 .....7.575
Ind.Harbor,Ind. I-2, Y1.7.575
Lackawanna,N.Y. B2 ..7.575
LosAngeles(25) B3 ....8.325
Seattle(25) B3 .....8.575
Sharon,Pa. S3 .....7.575
S.Chicago,Ill. W14 ....7.575
S.SanFrancisco(25) B3.8.325
SparrowsPoint,Md. B2 .7.575
Warren,O. R2 .....7.575
Weirton,W.Va. W6 ....7.575
Youngstown U5, Y1 ...7.575

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10 ....5.35
Warren,O. R2 .....5.875

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6 .....7.425
Baltimore T6 .....7.425
Boston T6 .....7.975
Buffalo S40 .....7.425
Cleveland A7, J5 .....7.425
Dearborn,Mich. S3 ....7.425
Detroit D2, M1, P20...7.425
Dover,O. G6 .....7.425
Evanston,Ill. M22 .....7.525
Farrell,Pa. S3 .....7.425
Follansbee,W.Va. F4 ...7.425
Fontana,Calif. K1 .....9.20
FranklinPark,Ill. T6 ..7.525
Ind.Harbor,Ind. Y1 ....7.425
Indianapolis S41 .....7.575
LosAngeles C1, S41 ....9.30
McKeesport,Pa. E10 ..7.525
NewBedford,Mass. R10.7.875
NewBritain,Conn. S15..7.875
NewCastle,Pa. B4, E5..7.425
NewHaven,Conn. D2 ...7.875
Pawtucket,R.I. R3 ....7.975
Pawtucket,R.I. N8 ....7.975
Philadelphia P24 .....7.875
Pittsburgh J5 .....7.425
Riverdale,Ill. A1 .....7.525
Rome,N.Y.(32) R6 ....7.425
Sharon,Pa. S3 .....7.425
Trenton,N.J.(31) R5 ..8.875
Wallingford,Conn. W2..7.875
Warren,O. R2, T5 .....7.425
Worcester,Mass. A7 ....7.975
Youngstown S41, Y1 ...7.425

STRIP, Cold-Rolled Alloy

Boston T6 .....15.90
Carnegie,Pa. S18 .....15.55
Cleveland A7 .....15.55
Dover,O. G6 .....15.55
Farrell,Pa. S3 .....15.55
FranklinPark,Ill. T6 ..15.55
Harrison,N.J. C18 ....15.55
Indianapolis S41 .....15.70
LosAngeles S41 .....17.75
Lowellville,O. S3 .....15.55
Pawtucket,R.I. N8 ....15.90
Riverdale,Ill. A1 .....15.55
Sharon,Pa. S3 .....15.55
Worcester,Mass. A7 ...15.85
Youngstown S41, Y1 ..7.425

STRIP, Cold-Rolled High-Strength, Low-Alloy

Cleveland A7 .....10.80
Dearborn,Mich. S3 ....10.80
Dover,O. G6 .....10.80
Farrell,Pa. S3 .....10.80
Ind.Harbor,Ind. Y1 ...10.80
Sharon,Pa. S3 .....10.80
Warren,O. R2 .....10.80

STRIP, Cold-Finished Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	9.50	10.70	12.90	15.90	18.85
Boston T6	9.50	10.70	12.90	15.90	18.85
Bristol,Conn. W1	...	10.70	12.90	16.10	19.30
Carnegie,Pa. S18	8.95	10.40	12.60	15.60	....
Cleveland A7	8.95	10.40	12.60	15.60	18.55
Dearborn,Mich. S3	9.05	10.50	12.70	....	....
Detroit D2	9.05	10.50	12.70	15.70	....
Dover,O. G6	8.95	10.40	12.60	15.60	18.55
Evanston,Ill. M22	8.95	10.40	12.60	15.60	....
Farrell,Pa. S3	8.95	10.40	12.60	15.60	18.55
Fostoria,O. S1	10.05	10.40	12.60	15.60	....
FranklinPark,Ill. T6	9.05	10.40	12.60	15.60	18.55
Harrison,N.J. C18	...	....	12.90	16.10	19.30
Indianapolis S41	9.10	10.55	12.60	15.60	18.55
LosAngeles C1	11.15	12.60	14.80	17.80	....
LosAngeles S41	11.15	12.60	14.80	....	....
NewBritain,Conn. S15	9.40	10.70	12.90	15.90	18.85
NewCastle,Pa. B4, E5	8.95	10.40	12.60	15.60	....
NewHaven,Conn. D2	9.40	10.70	12.90	15.90	....
NewKensington,Pa. A6	9.85	10.40	12.60	15.60	....
NewYork W3	...	10.70	12.90	16.10	19.30
Pawtucket,R.I. N8	9.50	10.70	12.90	15.90	18.85
Riverdale,Ill. A1	9.05	10.40	12.60	15.60	18.55
Rome,N.Y.(32) R6	8.95	10.40	12.60	15.60	18.55
Sharon,Pa. S3	8.95	10.40	12.60	15.60	18.55
Trenton,N.J. R5	...	10.70	12.90	15.90	18.85
Wallingford,Conn. W2	9.40	10.70	12.90	15.90	18.75
Warren,O. T5	8.95	10.40	12.60	15.60	18.55
Worcester Mass. A7, T6..	9.50	10.70	12.90	15.90	18.85
Youngstown S41	8.95	10.40	12.60	15.60	18.55

Spring Steel (Tempered)	Up to 0.80C	0.81-1.05C	1.06-1.35C
Bristol,Conn. W1	18.85	22.95	27.80
Buffalo W12	18.85	....	....
Fostoria,O. S1	19.05	22.15	....
FranklinPark,Ill. T6	19.20	23.30	28.15
Harrison,N.J. C18	18.85	22.95	27.80
NewYork W3	18.85	22.95	27.80
Palmer,Mass. W12	18.85	....	....
Trenton,N.J. R5	18.85	22.95	27.80
Worcester,Mass. A7, T6..	18.85	22.95	27.80
Youngstown S41	19.20	23.30	28.15

Weirton,W.Va. W6 ....10.80
Youngstown Y1 .....10.80

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2 .....8.175

STRIP, C. R. Electrogalvanized

Cleveland A7 .....7.425*
Dover,O. G6 .....7.425*
Evanston,Ill. M22 ....7.525*
McKeesport,Pa. E10 ..7.50*
Riverdale,Ill. A1 .....7.525*
Warren,O. B9, S3, T5.7.425*
Worcester,Mass. A7 ...7.975
Youngstown S41 .....7.425*

*Plus galvanizing extras.

STRIP, Galvanized (Continuous)

Farrell,Pa. S3 .....7.50
Sharon,Pa. S3 .....7.50

TIGHT COOPERAGE HOOP

Atlanta A11 .....5.65
Farrell,Pa. S3 .....5.525
Riverdale,Ill. A1 .....5.675
Sharon,Pa. S3 .....5.525
Youngstown U5 .....5.525

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$9.10	$9.35	$9.75
Fairfield,Ala. T2	9.20	9.45	9.85
Fairless,Pa. U5	9.20	9.45	9.85
Fontana,Calif. K1	9.75	10.00	10.40
Gary,Ind. U5	9.10	9.35	9.75
GraniteCity,Ill. G4	9.20	9.45	9.60
IndianaHarbor,Ind. I-2, Y1	9.10	9.35	9.75
Irvin,Pa. U5	9.10	9.35	9.75
Niles,O. R2	9.10	9.35	9.75
Pittsburg,Calif. C11	9.75	10.00	10.40
SparrowsPoint,Md. B2	9.10	9.35	9.75
Weirton,W.Va. W6	9.10	9.35	9.75
Yorkville,O. W10	9.10	9.35	9.75

ELECTROLYTIC TIN-COATED SHEET (Dollars per lb)

IndianaHarbor,Ind. Y1 (20-27 Ga.)	7.90	....	....
Niles,O. R2 (20-27 Ga.)	7.90	8.10	8.30
Aliquippa,Pa. J5 (21-27 Ga.)	7.90	8.10	....

TIN PLATE, American	1.25 lb	1.50 lb
Aliquippa,Pa.J5	$10.40	$10.65
Fairfield,Ala. T2	10.50	10.75
Fairless,Pa. U5	10.50	10.75
Fontana,Calif.K1	11.06	11.30
Gary,Ind. U5	10.40	10.65
Ind.Harb. Y1	10.40	10.65
Pitts.,Calif. C11	11.05	11.30
Sp.Pt.,Md. B2	10.40	10.65
Weirton,W.Va.W6	10.40	10.65
Yorkville,O. W10	10.40	10.65

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$8.20
Fairfield,Ala. T2	8.30
Fairless,Pa. U5	8.30
Fontana,Calif. K1	8.85
Gary,Ind. U5	8.20
GraniteCity,Ill. G4	8.30
Ind.Harbor,Ind. I-2, Y1	8.20
Irvin,Pa. U5	8.20
Niles,O. R2	8.20
Pittsburg,Calif. C11	8.85
SparrowsPoint,Md. B2	8.20
Weirton,W.Va. W6	8.20
Yorkville,O. W10	8.20

HOLLOWARE ENAMELING Black Plate (29 Gage)

Aliquippa,Pa. J5	7.85
Gary,Ind. U5	7.85
GraniteCity,Ill. G4	7.95
Ind.Harbor,Ind. Y1	7.85
Irvin,Pa. U5	7.85
Yorkville,O. W10	7.85

MANUFACTURING TERNES (Special Coated, Base Box)

Gary,Ind. U5	$10.05
Irvin,Pa. U5	10.05

SILICON STEEL

C.R. COILS & CUT LENGTHS (22 Ga.)

Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	....	11.70	12.40	13.35	14.65
Brackenridge,Pa. A4	....	....	12.40	13.55	14.65
GraniteCity,Ill. G4	9.975*	11.30*	12.00*	13.15*	....
IndianaHarbor,Ind. I-2	9.875*	11.20*	11.90*	13.05*	....
Mansfield,O. E6	9.875*	11.70	12.40	13.55	14.65
Newport,Ky. A2	9.875	11.70*	12.40*	13.55*	14.65*
Niles,O. M21	9.875*	11.70	12.40	13.55	....
Vandergrift,Pa. U5	9.875*	11.70	12.40	13.55	14.65
Warren,O. R2	9.875*	11.70	12.40	13.55	14.65
Zanesville,O. A10	....	11.70†	12.40	13.55	14.65

	Stator
Vandergrift,Pa. U5	8.10
Mansfield,O. E6	8.10
Warren,O. R2 (Silicon Lowcore)	8.10

SHEETS (22 Ga., coils & cut lengths) Fully Processed (Semiprocessed ½c lower)	T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	15.70	16.30	16.80	17.85
Vandergrift,Pa. U5	15.70	16.30	16.80	17.85
Zanesville,O. A10	15.70	16.30	16.80	17.85

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-66	T-72
Brackenridge,Pa. A4	....	18.10	19.70	20.20	20.70	15.70††
Butler,Pa. A10	....	....	....	19.70	20.20	20.70 ....
Vandergrift,Pa. U5	..	17.10	18.10	19.70	20.20	20.70 15.70
Warren,O. R2	....	....	....	....	....	.... 15.70‡

*Semiprocessed. †Fully processed only. ‡Coils, annealed; semiprocessed ½c lower. ††Coils only.

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2 ..8.00
Aliquippa,Pa. J5 .....8.00
Alton,Ill. L1 .....8.20
Atlanta A1 .....8.00
Bartonville,Ill. K4 .....8.10
Buffalo W12 .....8.00
Chicago W13 .....8.00
Cleveland A7, C20 ....8.00
Crawfordsville,Ind. M8..8.10
Donora,Pa. A7 .....8.00
Duluth A7 .....8.00
Fairfield,Ala. T2 .....8.00
Fostoria,O.(24) S1 .....8.10
Houston S5 .....8.25
Jacksonville,Fla. M8 ...8.35
Johnstown,Pa. B2 .....8.00
Joliet,Ill. A7 .....8.00
KansasCity,Mo. S5 .....8.25
Kokomo,Ind. C16 .....8.10
LosAngeles B3 .....8.95
Minnequa,Colo. C10 ....8.25
Monessen,Pa. P7, P16..8.00
Muncie,Ind. I-7 .....8.00
N.Tonawanda,N.Y. B11 .8.00
Palmer,Mass. W12 ....8.30
Pittsburg,Calif. C11 ...8.95
Portsmouth,O. P12 .....8.00
Rankin,Pa. A7 .....8.00
S.Chicago,Ill. R2 .....8.00
S.SanFrancisco C10 ....8.95
SparrowsPoint,Md. B2 ..8.10
Sterling,Ill.(1) N15 ....8.00
Sterling,Ill. N15 .....8.10
Struthers,O. Y1 .....8.00
Waukegan,Ill. A7 .....8.00
Worcester,Mass. A7 ....8.30

WIRE, Cold Heading Carbon

Elyria,O. W8 .....8.00

WIRE, Gal'd., for ACSR

Bartonville,Ill. K4 .....12.65
Buffalo W12 .....13.40
Cleveland A7 .....12.65
Donora,Pa. A7 .....12.65
Duluth A7 .....12.65
Johnstown,Pa. B2 .....13.40
KansasCity,Mo. U3 ...12.90
Minnequa,Colo. C10 ...12.775
Monessen,Pa. P7, P16..12.65
Muncie,Ind. I-7 .....13.60
NewHaven,Conn. A7 ..12.95
Palmer,Mass. W12 ....13.70
Pittsburg,Calif. C11 ...13.45
Portsmouth,O. P12 .....12.65
Roebling,N.J. R5 .....12.95
SparrowsPt.,Md. B2 ..13.50
Struthers,O. Y1 .....13.40
Trenton,N.J. A7 .....12.95
Waukegan,Ill. A7 .....12.65
Worcester,Mass. A7 ...12.95

WIRE, Upholstery Spring

Aliquippa,Pa. J5 .....9.75
Alton,Ill. L1 .....9.95
Buffalo W12 .....9.75
Cleveland A7 .....9.75
Donora,Pa. A7 .....9.75
Duluth A7 .....9.75
Johnstown,Pa. B2 .....9.75
KansasCity,Mo. S5, U3.10.00
LosAngeles B3 .....10.70
Minnequa,Colo. C10 ....9.95
Monessen,Pa. P7, P16..9.75
New Haven,Conn. A7 ..10.05
Palmer,Mass. W12 ....10.05
Pittsburg,Calif. C11 ...10.70
Portsmouth,O. P12 ....9.75
Roebling,N.J. R5 .....10.05
S.Chicago,Ill. R2 .....9.75
S.SanFrancisco C10 ...10.70
SparrowsPt.,Md. B2 ....9.85
Struthers,O. Y1 .....9.75
Trenton,N.J. A7 .....10.05
Waukegan,Ill. A7 .....9.75
Worcester,Mass. A7 ...10.05

WIRE, MB Spring, High-Carbon

Aliquippa,Pa. J5 .....9.75
Alton,Ill. L1 .....9.95
Bartonville,Ill. K4 .....9.85
Buffalo W12 .....9.75
Cleveland A7 .....9.75
Donora,Pa. A7 .....9.75
Duluth A7 .....9.75
Fostoria,O. S1 .....9.80
Johnstown,Pa. B2 .....9.75
KansasCity,Mo. S5, U3.10.00
LosAngeles B3 .....10.70
Milbury,Mass.(12) N6..10.05
Minnequa,Colo. C10 ....9.95
Monessen,Pa. P7, P16 ..9.75
Muncie,Ind. I-7 .....9.95
Palmer,Mass. W12 .....10.05
Pittsburg,Calif. C11 ...10.70
Portsmouth,O. P12 .....9.75
Roebling,N.J. R5 .....10.05
S.Chicago,Ill. R2 .....9.75
S.SanFrancisco C10 ...10.70
SparrowsPt.,Md. B2 ....9.85
Struthers,O. Y1 .....9.75
Trenton,N.J. A7 .....10.05
Waukegan,Ill. A7 .....9.75
Wor'ster,Mass.A7,J4,T6 10.05

WIRE, Fine & Weaving(8" Coils)

Alton,Ill. L1 .....16.50
Bartonville,Ill. K4 .....16.40
Chicago W13 .....16.30
Cleveland A7 .....16.30
Crawfordsville,Ind. M8..16.40
Fostoria,O. S1 .....16.30
Houston S5 .....16.55
Jacksonville,Fla. M8 ..16.65
Johnstown,Pa. B2 .....16.30
KansasCity,Mo. S5 .....16.55
Kokomo,Ind. C16 .....16.30
Minnequa,Colo. C10 ....16.55
Monessen,Pa. P16 .....16.30
Muncie,Ind. I-7 .....16.50
Palmer,Mass. W12 .....16.60
S.SanFrancisco C10 ....17.15
Waukegan,Ill. A7 .....16.30
Worcester,Mass. A7, J6.16.60

WIRE, Tire Bead

Bartonville,Ill. K4 .....17.15
Monessen,Pa. P16 .....17.15
Roebling,N.J. R5 .....17.65

ROPE WIRE (A)

Bartonville,Ill. K4 ....13.45
Buffalo W12 .....13.45
Fostoria,O. S1 .....13.45
KansasCity,Mo. U3 ....13.70
Johnstown,Pa. B2 .....13.45
Monessen,Pa. P7 .....13.45
Muncie,Ind. I-7 .....13.65
Palmer,Mass. W12 .....13.75
Portsmouth,O. P12 .....13.45
Roebling,N.J. R5 .....13.75
St.Louis L8 .....13.45
SparrowsPt.,Md. B2 ....13.55
Struthers,O. Y1 .....13.45
Worcester,Mass. J4 .....13.75

(A) Plow and Mild Plow; add 0.25c for Improved Plow.

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	12.35
Baltimore T6	12.65
Boston T6	12.65
Buffalo W12	12.35
Chicago W13	12.45
Cleveland A7	12.35
Crawfordsville,Ind. M8	12.35
Dover,O. G6	12.35
Farrell,Pa. S3	12.35
Fostoria,O. S1	12.35
FranklinPark,Ill. T6	12.45
Kokomo,Ind. C16	12.35
Massillon,O. R8	12.35
Milwaukee C23	12.55
Monessen,Pa. P7, P16	12.35
Palmer,Mass. W12	12.65
Pawtucket,R.I. N8	11.95
Philadelphia P24	12.65
Riverdale,Ill. A1	12.45
Rome,N.Y. R6	12.35
Sharon,Pa. S3	12.35
Trenton,N. J. R5	12.65
Warren,O. B9	12.35
Worcester,Mass. A7,T6	12.65

NAILS, Stock

	Col.
AlabamaCity,Ala. R2	173
Aliquippa,Pa. J5	173
Atlanta A11	175
Bartonville,Ill. K4	175
Chicago W13	173
Cleveland A9	173
Crawfordsville,Ind. M8	175
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston S5	178
Jacksonville,Fla. M8	175
Johnstown,Pa. B2	173
Joliet,Ill. A7	173
KansasCity, Mo. S5	178
Kokomo,Ind. C16	175
Minnequa,Colo. C10	178
Monessen,Pa. P7	173
Pittsburg,Calif. C11	192
Rankin,Pa. A7	173
S. Chicago,Ill. R2	173
SparrowsPt, Md. B2	175
Sterling,Ill. (7) N15	175
Worcester,Mass. A7	179

(To Wholesalers; per cwt)

Galveston,Tex. D7	$10.30

NAILS, Cut (100 lb keg) To Distributors (33)

Wheeling,W.Va. W10	$10.10

POLISHED STAPLES

	Col.
AlabamaCity,Ala. R2	175
Aliquippa,Pa. J5	173
Atlanta A11	177
Bartonville,Ill. K4	175
Crawfordsville,Ind. M8	177
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston S5	180
Jacksonville,Fla. M8	177
Johnstown,Pa. B2	175
Joliet,Ill. A7	173
KansasCity,Mo. S5	180
Kokomo,Ind. C16	177
Minnequa,Colo. C10	180
Pittsburg,Calif. C11	194
Rankin,Pa. A7	173
S.Chicago,Ill. R2	175
Sparrows Pt.,Md. B2	177
Sterling,Ill. (7) N15	175
Worcester,Mass. A7	181

TIE WIRE, Automatic Baler (14½ Ga.)(per 97 lb Net Box) Coil No. 3150

AlabamaCity,Ala. R2	$9.24
Atlanta A11	10.36
Bartonville,Ill. K4	9.34
Buffalo W12	10.26
Chicago W13	9.24
Crawfordsville,Ind. M8	9.34
Donora,Pa. A7	9.24
Duluth A7	9.24
Fairfield,Ala. T2	9.24
Houston S5	10.51
Jacksonville,Fla. M8	9.34
Johnstown,Pa. B2	10.26
Joliet,Ill. A7	9.24
KansasCity,Mo. S5	10.51
Kokomo,Ind. C16	9.34
LosAngeles B3	11.05
Minnequa,Colo. C10	10.51
Pittsburg,Calif. C11	9.94
S. Chicago, Ill. R2	9.24
S.SanFrancisco C10	11.04
SparrowsPt.,Md. B2	10.36
Sterling,Ill. (37) N15	9.24

Coil No. 6500 Stand.

AlabamaCity,Ala. R2	$9.54
Atlanta A11	10.70
Bartonville,Ill. K4	9.64
Buffalo W12	10.60
Chicago W13	9.54
Crawfordsville,Ind. M8	9.64
Donora,Pa. A7	9.54
Duluth A7	9.54
Fairfield,Ala. T2	9.54
Houston S5	10.85
Jacksonville,Fla. M8	9.64
Johnstown,Pa. B2	10.60
Joliet,Ill. A7	9.54
KansasCity,Mo. S5	10.85
Kokomo,Ind. C16	9.64
LosAngeles B3	11.40
Minnequa,Colo. C10	10.85
Pittsburg,Calif. C11	10.26
S.Chicago,Ill. R2	9.54
S.SanFrancisco C10	11.40
SparrowsPt.,Md. B2	10.70
Sterling,Ill. (37) N15	9.54

Coil No. 6500 Interim

AlabamaCity,Ala. R2	$9.59
Atlanta A11	10.75
Bartonville,Ill. K4	9.69
Buffalo W12	10.65
Chicago W13	9.59
Crawfordsville,Ind. M8	9.69
Donora,Pa. A7	9.59
Duluth A7	9.59
Fairfield,Ala. T2	9.59
Houston S5	10.90
Jacksonville,Fla. M8	9.69
Johnstown,Pa. B2	10.65
Joliet,Ill. A7	9.59
KansasCity,Mo. S5	10.90
Kokomo,Ind. C16	9.69
LosAngeles B3	11.45
Minnequa,Colo. C10	10.90
PittsburgCalif. C11	10.31
S.Chicago,Ill. R2	9.59
S.SanFrancisco C10	11.45
SparrowsPt.,Md. B2	10.75
Sterling,Ill.(37) N15	9.59

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	212
Atlanta A11	214
Bartonville,Ill. K4	214
Crawfordsville,Ind. M8	214
Donora,Pa. A7	212
Duluth A7	212
Fairfield,Ala. T2	212
Houston S5	217
Jacksonville,Fla. M8	214
Joliet,Ill. A7	212
KansasCity,Mo. S5	217
Kokomo,Ind. C16	214
Minnequa,Colo. C10	217
Pittsburg,Calif. C11	236
S.SanFrancisco C10	236
SparrowsPt.,Md. B2	214
Sterling,Ill.(7) N15	214

FENCE POSTS

Birmingham C15	177
ChicagoHts.,Ill. C2, I-2	177
Duluth A7	177
Franklin,Pa. F5	177
Johnstown,Pa. B2	177
Marion,O. P11	177
Minnequa,Colo. C10	182
Tonawanda,N.Y. B12	177

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	193**
Aliquippa,Pa. J5	190§
Atlanta A11	198§
Bartonville,Ill. K4	198
Crawfordsville,Ind. M8	198
Donora,Pa. A7	193†
Duluth A7	193†
Fairfield,Ala. T2	193†
Houston S5	198**
Jacksonville,Fla. M8	198
Johnstown,Pa. B2	196§
Joliet,Ill. A7	193†
KansasCity,Mo. S5	198**
Kokomo,Ind. C16	195†
Minnequa,Colo. C10	198**
Monessen,Pa. P7	196§
Pittsburg,Calif. C11	213†
Rankin,Pa. A7	193†
S.Chicago,Ill. R2	193**
S.SanFrancisco C10	213*
SparrowsPoint,Md. B2	198§
Sterling,Ill.(7) N15	195††

WOVEN FENCE, 9-15 Ga.

	Col.
Ala.City,Ala. R2	187**
Aliq'ppa,Pa.9-11½ga.J5	190§
Atlanta A11	192§
Bartonville,Ill. K4	192
Crawfordsville,Ind. M8	192
Donora,Pa. A7	187†
Duluth A7	187†
Fairfield,Ala. T2	187†
Houston S5	192**
Jacksonville,Fla. M8	192
Johnstown,Pa.(43) B2	190§
Joliet,Ill. A7	187†
KansasCity,Mo. S5	192**
Kokomo,Ind. C16	189†
Minnequa,Colo. C10	192**
Pittsburg,Calif. C11	210†
Rankin,Pa. A7	187†
S.Chicago,Ill. R2	187**
Sterling,Ill.(7) N15	192††

WIRE (16 gage)

	An'ld Stone	Galv. Stone
Ala.City,Ala.R2	17.85	19.40**
Aliq'ppa,Pa. J5	17.85	19.65
Bartonville K4	17.95	19.80
Cleveland A7	17.85	....
Craw'dville M8	17.95	19.80‡‡
Fostoria,O. S1	18.35	19.90†
Houston S5	18.10	19.65**
Jacksonville M8	17.95	19.80‡‡
Johnstown B2	17.85	19.65§
Kan.City,Mo. S5	18.10	....
Kokomo C16	17.25	18.80‡
Minnequa C10	18.10	19.65**
P'lm'r,Mass.W12	18.15	19.70†
Pitts.,Calif. C11	18.20	19.75†
S.SanFran. C10	18.20	19.75**
St'ling(37) N15	17.25	19.05††
SparrowsPt. B2	17.95	19.75§
Waukegan A7	17.85	19.40†
Worcester A7	18.15	....

WIRE, Merchant Quality (6 to 8 gage)

	An'ld	Galv.
Ala.City,Ala. R2	9.00	9.55**
Aliquippa J5	8.65	9.325§
Atlanta(48)A11	9.10	9.775§
Bartonville(48) K4	9.10	9.80
Buffalo W12	9.00	9.55†
Cleveland A7	9.00	....
Crawfordsville M8	9.10	9.80‡‡
Donora,Pa. A7	9.00	9.55†
Duluth A7	9.00	9.55†
Fairfield T2	9.00	9.55†
Houston(48) S5	9.25	9.80**
Jack'ville,Fla. M8	9.10	9.80‡‡
Johnstown(48) B2	9.00	9.675§
Joliet,Ill. A7	9.00	9.55†
Kans.City(48) S5	9.25	9.80**
Kokomo(48) S16	9.10	9.65†
LosAngeles B3	9.95	10.625§
Monessen(48) P7	8.65	9.35§
Palmer,Mass. W12	9.30	9.85†
Pitts.,Calif. C11	9.95	10.50†
Rankin,Pa. A7	9.00	9.55†
S.Chicago R2	9.00	9.55**
S.SanFran. C10	9.95	10.50**
Spar'wsPt.(48)B2	9.10	9.775§
St'ling(1)(48)N15	9.00	9.70†§
Struthers,O. Y1	9.00	9.65‡
Worcester,Mass.A7	9.30	9.85†

Based on zinc price of: *13.50. †5c. §10c. ‡Less than 10c. ††10.50c. ‡‡11.00c. **Subject to zinc equalization extras. §§11.50c.

FASTENERS

(Base discounts, shipments of one to four containers, per cent off list, f.o.b. mill)

BOLTS

Machine Bolts
Full Size Body (cut thread)
½ in. and smaller:
3 in. and shorter .. 55.0
3¼ in. thru 6 in. .. 50.0
Longer than 6 in. .. 37.0
⅝ in., 3 in. & shorter 47.0
3¼ in. thru 6 in. .. 40.0
Longer than 6 in. .. 31.0
⅞ in. thru 1 in.:
6 in. and shorter .. 37.0
Longer than 6 in. .. 31.0
1¼ in. and larger:
All lengths 31.0
Undersize Body (rolled thread)
½ in. and smaller:
3 in. and shorter .. 55.0
3¼ in. thru 6 in. .. 50.0

Carriage Bolts
Full Size Body (cut thread) & Undersize Body (rolled thread)
½ in. and smaller:
6 in. and shorter .. 48.0
Larger diameters and longer length ... 35.0

Lag, Plow, Tap, Blank Step, Elevator, Tire, and Fitting Up Bolts
½ in. and smaller:
6 in. and shorter .. 48.0
Larger diameters and longer lengths ... 35.0

High Tensile Structural Bolts
(Reg. semifinished hex head bolts, heavy semifinished hex nuts. Bolts — High-carbon steel, heat treated. Spec. ASTM A-325, in bulk. Full keg quantity)
⅝ in. diam 50.0
⅞ in. diam 47.0
⅞ and 1 in. diam. 43.0
1⅛ and 1¼ in. diam 34.0

NUTS

(Keg or case quantity and over)

Square Nuts, Reg. & Heavy:
All sizes 56.0
(Full container)

Hex Nuts, Reg. & Heavy Hot Pressed & Cold Punched:
¾ in. and smaller.. 62.0
⅞ in. to 1½ in., incl. 56.0
1⅝ in. and larger .. 51.5

Hex Nuts, Semifinished, Heavy (Incl. Slotted):
¾ in. and smaller.. 62.0
⅞ in. to 1⅛ in. incl. 56.0
1⅛ in. and larger 51.5

Hex Nuts, Finished (Incl. Slotted and Castellated):
⅞ in. and smaller.. 65.0
1 in. to 1½ in., incl. 57.0
1⅝ in. and larger.. 51.5

Semifinished Hex Nuts, Reg. (Incl. Slotted):
⅝ in. and smaller.. 62.0
¾ in. to ⅞ in., incl. 65.0
1 in. to 1½ in., incl. 57.0
1⅝ in. and larger.. 51.5

CAP AND SETSCREWS
(Base discounts, packages, per cent off list, f.o.b. mill)

Hex Head Cap Screws, Coarse or Fine Thread, Bright:
6 in. and shorter:
⅝ in. and smaller.. 35.0
¾, ⅞, and 1 in. .. 16.0
Longer than 6 in.:
⅝ in. and smaller.. 3.0
¾, ⅞, and 1 in. ..+11.0

High Carbon, Heat Treated:
6 in. and shorter:
⅝ in. and smaller.. 20.0
¾, ⅞, and 1 in. ..+ 5.0
Longer than 6 in.:
⅝ in. and smaller..+19.0
¾, ⅞, and 1 in. ..+39.0

Flat Head Cap Screws:
¾ in. and smaller, 6 in. and shorter ..+85.0

Setscrews, Square Head, Cup Point, Coarse Thread:
Through 1 in. diam:
6 in. and shorter ..+ 5.0
Longer than 6 in. ..+29.0

RIVETS

F.o.b. Cleveland and/or freight equalized with Pittsburgh, f.o.b. Chicago and/or freight equalized with Birmingham except where equalization is too great.

Structural ½ in., larger 12.85, ⅞ in. and smaller by 6 in. and shorter: 15.0%.

PRESTRESSED STRAND

(High strength, stress relieved; 7 wire uncoated. Net prices per 1000 ft, 40,000 lb and over)

	Standard Diameter, Inches				
	1/4	5/16	3/8	7/16	1/2
Alton,Ill. L1	$28.95	$43.40	$55.40	$73.00	$95.10
Buffalo W12	28.95	43.40	55.40	73.00	95.10
Cleveland A7	28.95	43.40	55.40	73.00	....
KansasCity,Mo. U3	29.85	43.40	55.40	73.00	95.10
Monessen,Pa. P16	32.15	48.20	61.55	81.10	105.65
NewHaven,Conn. A7	28.95	43.40	55.40	73.00	95.10
Pittsburg,Calif. C11	....	43.40	55.40	73.00	....
Pueblo,Colo. W12	28.95	43.40	55.40	73.00	95.10
Roebling,N.J. R5	28.95	43.40	55.40	73.00	95.10
SparrowsPoint,Md. B2	28.95	43.40	55.40	73.00	95.10
St.Louis L8	28.95	43.40	55.40	73.00	95.10
Waukegan,Ill. A7	28.95	43.40	55.40	73.00	95.10

RAILWAY MATERIALS

	Standard		Too Rails	
Rails	No. 1	No. 2	All No. 2	60 lb Under
Bessemer,Pa. U5	5.75	5.65	....	6.725
Ensley,Ala. T2	5.75	5.65	....	6.725
Fairfield,Ala. T2	....	....	....	6.725
Gary,Ind. U5	5.75	5.65	....	....
Huntington,W.Va. C15	....	....	....	6.725
Johnstown Pa. B2	....	....	....(16)	6.725
Lackawanna,N.Y. B4	5.75	5.65	....	6.725
Minnequa,Colo. C10	5.75	5.65	....	7.225
Steelton,Pa. B2	5.75	5.65	....	....
Williamsport,Pa. S19	....	....	....	6.725

TIE PLATES

Fairfield,Ala. T2	6.875
Gary,Ind. U5	6.875
Lackawanna,N.Y. B2	6.875
Minnequa,Colo. C10	6.875
Seattle B3	7.025
Steelton,Pa. B2	6.875
Torrance,Calif. C11	6.875

JOINT BARS

Bessemer,Pa. U5	7.25
Fairfield,Ala. T2	7.25
Joliet,Ill. U5	7.25
Lackawanna,N.Y. B2	7.25
Minnequa,Colo C10	7.25
Steelton,Pa. B2	7.25

AXLES

Ind.Harbor,Ind. S13	9.125
Johnstown,Pa. B2	9.125

TRACK BOLTS, Untreated

Cleveland R2	15.35
KansasCity,Mo. S5	15.35
Lebanon,Pa. B2	15.35
Minnequa,Colo. C10	15.35
Pittsburgh S44	14.75
Seattle B3	15.85

SCREW SPIKES

Lebanon,Pa. B2	15.10

STANDARD TRACK SPIKES

Fairfield,Ala. T2	9.75
Ind.Harbor,Ind. I-2,Y1	10.10
KansasCity,Mo. S5	10.10
Lebanon,Pa. B2	10.10
Minnequa,Colo. C10	10.10
Pittsburgh J5	10.10
Seattle B3	10.60
S.Chicago,Ill. R2	10.10
Struthers,O. Y1	10.10
Youngstown R2	10.10

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1½ to under 1 7/16 in.; 1 7/16 to under 1 15/16 in., 6.70c; 1 15/16 to 8 in., inclusive, 7.05c.
(6) Chicago or Birm. base.
(7) Chicago base 2 cols. lower.
(8) 16 Ga. and heavier.
(9) Merchant quality; add 0.35c for special quality.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for .17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ⅝" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(21) New Haven, Conn., base.
(22) Deld. San Francisco Bay area.
(23) Special quality.
(24) Deduct 0.05c, finer than 15 Ga.
(25) Bar mill bands.
(26) Deld. in mill zone, 6.295c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c.
(31) Widths over ⅝ in.; 7.375c, for widths ⅝ in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) Chicago base, 10 points lower.
(38) 13 Ga. & lighter; 60" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. in mill zone or within switching limits, 5.635c.
(43) 9-14½ Ga.
(44) To fabricators.
(48) 6-7 Ga.
(49) 3½ in. and smaller rounds; 9.65c, over 3½ in. and other shapes.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25
Ambridge, Pa. N2	+12.25	....	+5.75	....	+3.25	....	+1.75	....	+1.75	....	+2	....	0.5	....
Lorain, O. N3	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25
Youngstown Y1	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25

ELECTRIC STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Alton, Ill. L1	....	....	....	....	....	....	0.25	+15	3.25	+11	6.75	+6.5	9.25	+5.75
Benwood, W. Va. W10	1.5	+25	+10.5	+34	+21	+42.5	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Butler, Pa. F6	4.5	+22	+8.5	+32	+19.5	+41	....	....	....	....	....	....	....	....
Etna, Pa. N2	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Fairless, Pa. N3	....	....	....	....	....	....	0.25	+15	3.25	+11	6.75	+6.5	9.25	+5.75
Fontana, Calif. K1	....	....	....	....	....	....	+10.75	+26	+7.75	+22	+4.25	+17.5	+1.75	+16.75
Indiana Harbor, Ind. Y1	....	....	....	....	....	....	1.25	+14	4.25	+10	7.75	+5.5	10.25	+6.25
Lorain, O. N3	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Sharon, Pa. S4	4.5	+22	+8.5	+32	+19.5	+41	....	....	....	....	....	....	....	....
Sharon, Pa. M6	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Sparrows Pt., Md. B2	2.5	+24	+10.5	+34	+21.5	+43	0.25	+15	3.25	+11	6.75	+6.5	9.25	+5.75
Wheatland, Pa. W9	4.5	+22	+8.5	+32	+19.5	+41	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Youngstown R2, Y1	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.72		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Alton, Ill. L1	9.75	+4.75	10.25	+4.25	11.75	+4.5	11.75	+4.5	1.25	+15.5	1.25	+15.5
Benwood, W. Va. W10	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Etna, Pa. N2	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Fairless, Pa. N3	9.75	+4.75	10.25	+4.25	11.75	+4.5	11.75	+5.5	1.25	+15.5	1.25	+15.5
Fontana, Calif. K1	+1.25	+15.75	+0.75	+15.25	0.75	+15.5	0.75	+15.5	+9.75	+26.5	+9.75	+26.5
Indiana Harbor, Ind. Y1	10.75	+3.75	11.25	+3.25	12.75	+3.5	12.25	+3.5	2.25	+14.5	2.25	+14.5
Lorain, O. N3	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+3.5	....	....	....	....
Sharon, Pa. M6	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	....	....	....	....
Sparrows Pt., Md. B2	9.75	+4.75	10.25	+4.25	11.75	+4.5	11.75	+4.5	1.25	+15.5	1.25	+15.5
Wheatland, Pa. W9	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Youngstown R2, Y1	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5

*Galvanized pipe discounts based on price of zinc at 11.00c, East St. Louis.

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	—Rerolling— Ingot	Slabs	Forging Billets	H.R. Strip	H.R. Rods; C.F. Wire	Bars; Structural Shapes	Plates	Sheets	C.R. Strip; Flat Wire
201	22.75	25.00	....	36.00	....	43.50	39.25	48.50	45.00
202	24.75	28.25	37.75	39.00	42.25	44.50	40.00	49.25	49.25
301	24.00	26.00	38.75	37.25	43.50	46.00	41.25	51.25	47.50
302	26.25	29.50	39.50	40.50	44.25	46.75	42.25	52.00	52.00
302B	26.50	30.75	42.25	45.75	46.75	49.00	44.50	57.00	57.00
303	....	33.25	42.50	....	47.25	49.75	45.00	56.75	56.75
304	28.00	31.25	42.00	43.75	47.00	49.50	45.75	55.00	55.00
304L	....	....	49.75	51.50	54.75	57.25	53.50	62.75	62.75
305	29.50	34.75	44.00	47.50	47.00	49.50	46.25	58.75	58.75
308	32.00	36.25	49.00	50.25	54.75	57.75	55.25	63.00	63.00
309	41.25	47.50	60.00	64.50	66.25	69.50	66.00	80.50	80.50
310	51.50	59.50	81.00	84.25	89.75	94.50	87.75	96.75	96.75
314	....	....	80.50	....	89.75	94.50	87.75	....	104.25
316	41.25	47.50	64.50	68.50	71.25	75.75	71.75	80.75	80.75
316L	....	....	72.25	76.25	79.50	83.50	79.50	88.50	88.50
317	49.75	58.00	79.75	88.25	89.50	94.25	88.50	101.00	101.00
321	33.50	38.00	48.75	53.50	54.50	57.50	54.75	65.50	65.50
330	....	....	123.25	....	113.00	143.75	135.00	149.25	149.25
18-8 CbTa	38.50	48.25	57.75	63.50	63.75	67.25	64.75	79.25	79.25
403	....	....	29.25	....	33.25	35.00	30.00	40.25	40.25
405	20.25	26.50	30.75	36.00	34.75	36.50	32.50	46.75	46.75
410	17.50	19.50	29.25	31.00	33.25	35.00	30.00	40.25	40.25
416	....	....	29.75	....	33.75	35.50	31.25	48.25	48.25
420	....	31.50	35.50	41.75	40.75	42.75	40.25	62.00	62.00
430	17.75	19.75	29.75	32.00	33.75	35.50	31.00	40.75	40.75
430F	....	....	30.50	....	34.25	36.00	31.75	51.75	51.75
431	....	29.75	39.25	....	43.50	46.00	41.00	56.00	56.00
446	....	....	40.75	59.00	46.00	48.25	42.75	70.00	70.00

Producers Are: Allegheny Ludlum Steel Corp.; American Steel & Wire Div., U. S. Steel Corp.; Anchor Drawn Steel Co., division of Vanadium-Alloys Steel Co.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; A. M. Byers Co.; Calstrip Steel Corp.; G. O. Carlson Inc.; Carpenter Steel Co.; Carpenter Steel Co. of New England; Charter Wire Products; Crucible Steel Co. of America; Damascus Tube Co.; Dearborn Div., Sharon Steel Corp.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Firth Sterling Inc.; Fort Wayne Metals Inc.; Green River Steel Corp., subsidiary of Jessop Steel Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Ellwood Ivins Steel Tube Works Inc.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Stainless & Strip Div., Jones & Laughlin Steel Corp.; Joslyn Stainless Steels, division of Joslyn Mfg. & Supply Co.; Latrobe Steel Co.; Lukens Steel Co.; Maryland Fine & Specialty Wire Co. Inc.; McLouth Steel Corp.; Metal Forming Corp.; Midvale-Heppenstall Co.; National Standard Co.; National Tube Div., U. S. Steel Corp.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Riverside-Alloy Metal Div., H. K. Porter Company, Inc.; Rodney Metals Inc.; Sawhill Tubular Products Inc.; Sharon Steel Corp.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Standard Tube Co.; Superior Steel Div., Copperweld Steel Co.; Superior Tube Co.; Swepco Tube Corp.; Techalloy Co. Inc.; Timken Roller Bearing Co.; Trent Tube Co., subsidiary of Crucible Steel Co. of America; Tube Methods Inc.; Ulbrich Stainless Steel Inc.; Union Steel Corp.; U. S. Steel Corp.; Universal Cyclops Steel Corp.; Vanadium-Alloys Steel Co.; Wall Tube & Metal Products Co.; Wallingford Steel, subsidiary, Allegheny Ludlum Steel Corp.; Washington Steel Corp.; Seymour Mfg. Co.

Clad Steel

	Plates 5%	Plates Carbon Base 10%	Plates Carbon Base 15%	Plates Carbon Base 20%	Sheets Carbon Base 20%
Stainless					
302	....	....	....	....	37.50
304	26.05	28.80	31.55	34.30	39.75
304L	30.50	33.75	36.95	40.15	....
316	38.20	42.20	46.25	50.25	58.25
316L	42.30	46.75	51.20	55.65	....
316 Cb	49.90	55.15	60.40	65.65	....
321	31.20	34.50	37.75	41.05	47.25
347	36.90	40.80	44.65	48.55	57.00
405	22.25	24.60	26.90	29.25	....
410	20.55	22.70	24.85	27.00	....
430	21.20	23.45	25.65	27.90	....
Inconel	48.90	59.55	70.15	80.85	....
Nickel	41.65	51.95	63.30	72.70	....
Nickel, Low Carbon	41.95	52.60	63.30	74.15	....
Monel	43.35	53.55	63.80	74.05	....

	Strip, Carbon Base —Cold Rolled— 10%	Both Sides
Copper*	$36.20	$43.15

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4, and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Reg. Carbon (W-1)	0.330	W-Cr Hot Work (H-12)	0.530
Spec. Carbon (W-1)	0.385	W Hot Wk. (H-21)	1.425-1.44
Oil Hardening (O-1)	0.505	V-Cr Hot Work (H-13)	0.550
V-Cr Hot Work (H-11)	0.50	Hi-Carbon-Cr (D-11)	0.955

Grade by Analysis (%) W	Cr	V	Co	Mo	AISI Designation	$ per lb
18	4	1	....	....	T-1	1.840
18	4	2	....	....	T-2	2.005
13.5	4	3	....	....	T-3	2.105
18.25	4.25	1	4.75	....	T-4	2.545
18	4	2	9	....	T-5	2.915
20.25	4.25	1.6	12.95	....	T-6	4.330
13.75	3.75	2	5	....	T-8	2.485
1.5	4	1	....	8.5	M-1	1.200
6.4	4.5	1.9	....	5	M-2	1.345
6	4	3	....	6	M-3	1.590

Tool steel producers include: A4, A8, B2, B8, C4, C9, C12, C18, F2, J3, L3, M14, S8, U4, V2, and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate.

	Basic	No. 2 Foundry	Malleable	Bessemer
Birmingham District				
Birmingham R2	62.00	62.50**	....	....
Birmingham U6	....	62.50**	66.50	....
Woodward, Ala. W15	62.00*	62.50**	66.50	....
Cincinnati, deld.	....	70.20	....	....
Buffalo District				
Buffalo H1, R2	66.00	66.50	67.00	67.50
N. Tonawanda, N.Y. T9	....	66.50	67.00	67.50
Tonawanda, N.Y. W12	66.00	66.50	67.00	67.50
Boston, deld.	77.29	77.79	78.29	....
Rochester, N.Y., deld.	69.02	69.52	70.02	....
Syracuse, N.Y., deld.	70.12	70.62	71.12	....
Chicago District				
Chicago I-3	66.00	66.50	66.50	67.00
S. Chicago, Ill. R2	66.00	66.50	66.50	67.00
S. Chicago, Ill. W14	66.00	....	66.50	67.00
Milwaukee, deld.	69.02	69.52	69.52	70.02
Muskegon, Mich., deld.	....	74.52	74.52	....
Cleveland District				
Cleveland R2, A7	66.00	66.50	66.50	67.00
Akron, Ohio, deld.	69.52	70.02	70.02	70.52
Mid-Atlantic District				
Birdsboro, Pa. B10	68.00	68.50	69.00	69.50
Chester, Pa. P4	68.00	68.50	69.00	....
Swedeland, Pa. A3	68.00	68.50	69.00	69.50
NewYork, deld.	....	75.50	76.00	....
Newark, N.J., deld.	72.69	73.19	73.69	74.19
Philadelphia, deld.	70.41	70.91	71.41	71.99
Troy, N.Y. R2	68.00	68.50	69.00	69.50
Pittsburgh District				
NevilleIsland, Pa. P6	66.00	66.50	66.50	67.00
Pittsburgh (N&S sides), Aliquippa, deld.	....	67.95	67.95	68.48
McKeesRocks, Pa. deld.	....	67.60	67.60	68.13
Lawrenceville, Homestead, Wilmerding, Monaca, Pa., deld.	....	68.26	68.26	68.79
Verona, Trafford, Pa., deld.	68.29	68.82	68.82	69.35
Brackenridge, Pa., deld.	68.60	69.10	69.10	69.63
Midland, Pa. C18	66.00	....	....	....
Youngstown District				
Hubbard, Ohio Y1	....	....	66.50	....
Sharpsville, Pa. S6	66.00	....	66.50	67.00
Youngstown Y1	....	....	66.50	....
Mansfield, Ohio, deld.	71.30	....	71.80	72.30
Duluth I-3	66.00	66.50	66.50	67.00
Erie, Pa. I-3	66.00	66.50	66.50	67.00
Everett, Mass. E1	67.50	68.00	68.50	....
Fontana, Calif. K1	75.00	75.50	....	....
Geneva, Utah C11	66.00	66.50	....	....
GraniteCity, Ill. G4	67.90	68.40	68.90	....
Ironton, Utah C11	66.00	66.50	....	....
Minnequa, Colo. C10	68.00	68.50	69.00	....
Rockwood, Tenn. T3	....	62.50‡	66.50	....
Toledo, Ohio I-3	66.00	66.50	66.50	67.00
Cincinnati, deld.	72.94	73.44	....	....

*Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.
**Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.50.
‡Phos. 0.50% up; Phos. 0.30-0.49%, $63.50.

PIG IRON DIFFERENTIALS

Silicon: Add 75 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos. iron on which base is 1.75-2.00%.

Manganese: Add 50 cents per ton for each 0.25% manganese over 1% or portion thereof.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.01-6.50% silicon; add 75c for each 0.50% silicon or portion thereof over the base grade within a range of 6.50 to 11.50%; starting with silicon over 11.50% add $1.50 per ton for each 0.50% silicon or portion thereof up to 14%; add $1 for each 0.50% Mn over 1%)

Jackson, Ohio I-3, J1	$78.00
Buffalo H1	79.25

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.25 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

CalvertCity, Ky. P15	$99.00
NiagaraFalls, N.Y. P15	99.00
Keokuk, Iowa Open-hearth & Fdry. $9 freight allowed K2	103.50
Keokuk, Iowa O.H. & Fdry, 12½ lb piglets, 16% Si, max frgt allowed up to $9, K2	106.50

LOW PHOSPHORUS PIG IRON, Gross Ton

Lyles, Tenn. T3 (Phos. 0.035% max)	$73.00
Rockwood, Tenn. T3 (Phos. 0.035% max)	73.00
Troy, N.Y. R2 (Phos. 0.035% max)	73.00
Philadelphia, deld.	81.67
Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Duluth I-3 (Intermediate) (Phos. 0.036-0.075%)	71.00
Erie, Pa. I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
NevilleIsland, Pa. P6 (Intermediate) (Phos. 0.036-0.075% max)	71.00

Steel Service Center Products

Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 15 cents per 100 lb except: Denver, Moline, Norfolk, Richmond, Washington, 20 cents; Baltimore, Boston, Los Angeles, New York, Philadelphia, Portland, Spokane, San Francisco, 10 cents; Atlanta, Birmingham, Chattanooga, Houston, Seattle, no charge.

	SHEETS				STRIP	BARS			Standard Structural Shapes	PLATES	
	Hot-Rolled	Cold-Rolled	Galv. 10 Ga.†	Stainless Type 302	Hot-Rolled*	H.R. Rounds	C.F. Rds.‡	H.R. Alloy 4140††[5]		Carbon	Floor
Atlanta	8.59§	9.86§	10.13	....	8.91	9.39	13.24#	....	9.40	9.29	11.21
Baltimore	8.55	9.25	9.99	....	9.05	9.45	11.85#	15.48	9.55	9.00	10.50
Birmingham	8.18	9.45	10.46	....	8.51	8.99	....	....	9.00	8.89	10.90
Boston	10.07	11.12	11.92	53.50	12.17	10.19	13.30#	15.64	10.64	10.27	11.95
Buffalo	8.40	9.60	10.85	55.98	8.75	9.15	11.45#	15.40	9.25	9.20	10.75
Chattanooga	8.35	9.69	9.65	....	8.40	8.77	10.46	....	8.88	8.80	10.66
Chicago	8.25	9.45	10.90	53.00	8.51	8.99	9.15	15.05	9.00	8.89	10.20
Cincinnati	8.43	9.51	10.95	53.43	8.83	9.31	11.53#	15.37	9.56	9.27	10.53
Cleveland	8.36	9.54	11.00	52.33	8.63	9.10	11.25#	15.16	9.39	9.13	10.44
Dallas	8.80	9.30	....	....	8.85	8.80	....	....	8.75	9.15	10.40
Denver	9.40	11.84	12.94	....	9.43	9.80	11.19	....	9.84	9.76	11.08
Detroit	8.51	9.71	11.25	56.50	8.88	9.30	9.51	15.33	9.56	9.26	10.46
Erie, Pa.	8.35	9.45	9.95[10]	....	8.60	9.10	11.25	....	9.35	9.10	10.60
Houston	8.40	8.90	10.29	52.00	8.45	8.40	11.60	15.75	8.35	8.75	10.10
Jackson, Miss.	8.52	9.79	....	....	8.84	9.82	10.68	....	9.33	9.22	11.03
Los Angeles	8.70[2]	10.80[2]	12.20	57.60	9.15	9.10[2]	12.95[2]	16.35	9.00[2]	9.10[2]	11.30[2]
Memphis, Tenn.	8.59	9.80	....	....	8.84	9.32	11.25#	....	9.33	9.22	10.86
Milwaukee	8.39	9.59	11.04	....	8.65	9.13	9.39	15.19	9.22	9.03	10.34
Moline, Ill.	8.55	9.80	....	....	8.84	8.95	9.15	....	8.99	8.91	....
New York	9.17	10.49	11.30	53.08	9.64	9.99	13.25#	15.50	9.74	9.77	11.05
Norfolk, Va.	8.65	....	....	....	9.15	9.30	12.75	....	9.65	9.10	10.50
Philadelphia	8.20	9.25	10.61	52.71	9.25	9.40	11.95#	15.48	9.10	9.15	10.40**
Pittsburgh	8.35	9.55	10.90	52.00	8.61	8.99	11.25#	15.05	9.00	8.89	10.20
Richmond, Va.	8.65	....	10.79	....	9.15	9.55	....	....	9.65	9.10	10.60
St. Louis	8.63	9.83	11.28	....	8.89	9.37	9.78	15.43	9.48	9.27	10.58
St. Paul	8.79	10.04	11.49	....	8.84	9.21	9.86	....	9.38	9.30	10.49
San Francisco	9.65	11.10	11.40	55.10	9.75	10.15	13.60	16.25	9.85	10.00	12.35
Seattle	10.30	11.55	12.50	56.52	10.25	10.50	14.70	16.80[2]	10.20	10.10	12.50
South'ton, Conn.	9.07	10.33	10.71	....	9.48	9.74	....	....	9.57	9.57	10.91
Spokane	10.30	11.55	12.50	57.38	10.75	11.00	14.70	16.80	10.20	10.10	13.00
Washington	9.15	....	....	....	9.65	10.05	12.50	....	10.15	9.60	11.10

*Prices do not include gage extras; †prices include gage and coating extras; ‡includes 35-cent bar quality extras; §42 in. and under; **⅛ in. and heavier; ††as annealed; ‡‡¾ in. to 4 in. wide, inclusive; #net price, 1 in. round C-1018.

Base quantities, 2000 to 4999 lb except as noted; cold-finished bars, 2000 lb and over except in Seattle, 2000 to 3999 lb; stainless sheets, 5000 lb except in Chicago, New York, Boston, Seattle, 10,000 lb and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb, except in Seattle, 30,000 lb and over; [2]—30,000 lb; [5]—1000 to 4999 lb; [10]—1000 to 1999 lb; [10]—2000 lb and over.

Refractories

Fire Clay Brick (per 1000 pieces*)

High-Heat Duty: Ashland, Grahn, Hayward, Hitchens, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Winburne, Snow Shoe, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parrall, Portsmouth, Ohio, Ottawa, Ill. Stevens Pottery, Ga., Canon City, Colo., $140; Salina, Pa., $145; Niles, Ohio, $138; Cutler, Utah, $175.

Super-Duty: Ironton, Ohio, Vandalia, Mo., Olive Hill, Ky., Clearfield, Salina, Winburne, Snow Shoe, Pa., New Savage, Md., St. Louis, $185; Stevens Pottery, Ga., $195; Cutler, Utah, $248.

Silica Brick (per 1000 pieces*)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Pt. Matilda, Pa., Portsmouth, Ohio, Hawstone, Pa., St. Louis, $158; Warren, Niles, Windham, Ohio, Hays, Latrobe, Morrisville, Pa., $163; E. Chicago, Ind., Joliet, Rockdale, Ill., $168; Canon City, Colo., $173; Lehi, Utah, $183; Los Angeles, $185.

Super-Duty: Sproul, Hawstone, Pa., Niles, Warren, Windham, Ohio, Leslie, Md., Athens, Tex., $158; Morrisville, Hays, Latrobe, Pa., $163; E. Chicago, Ind., St. Louis, $168; Canon City, Colo., $183; Curtner, Calif., $185.

Semisilica Brick (per 1000 pieces*)

Woodbridge, N. J., Canon City, Colo., $140; Philadelphia, Clearfield, Pa., $145.

Ladle Brick (per 1000 pieces*)

Dry Pressed: Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Vanport, Pa., Mexico, Vandalia, Mo., Wellsville, Irondale, New Salisbury, Ohio, $96.75; Clearfield, Pa., Portsmouth, Ohio, $102.

High-Alumina Brick (per 1000 pieces*)

50 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., Danville, Ill., $253; Philadelphia, $265; Clearfield, Pa., $230; Orviston, Snow Shoe, Pa., $260.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $310; Danville, Ill., $313; Clearfield, Orviston, Snow Shoe, Pa., $320; Philadelphia, $325.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $350; Danville, Ill., $353; Clearfield, Orviston, Snow Shoe, Pa., $360; Philadelphia, $365.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., St. Louis, $188; Ottawa, Ill., $205.

Nozzles (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., St. Louis, $310.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., $234.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, Gibsonburg, Narlo, Ohio, $16.75; Thornton, McCook, Ill., $17; Dolly Siding, Bonne Terre, Mo., $15.60.

Magnesite (per net ton)

Domestic, dead-burned, ½ in. grains with fines: Chewelah, Wash., Luning, Nev., $46; ⅜ in. grains with fines: Baltimore, $73.

*—9 in. x 4½ x 2.50 sts.

Fluorspar

Metallurgical grades, f.o.b. shipping point in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $37-$41; 70%, $36-$40; 60%, $33-$36.50. Imported, net ton, f.o.b. cars point of entry, duty paid, metallurgical grade; European, $30-$33, contract; Mexican, all rail, duty paid, $25; barge, Brownsville, Tex., $27.

Ores

Lake Superior Iron Ore

(Prices effective at start of the 1959 shipping season, subject to later revision, gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Mesabi bessemer	$11.60
Mesabi nonbessemer	11.45
Old Range bessemer	11.85
Old Range nonbessemer	11.70
Open-hearth lump	12.70
High phos	11.45

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect Jan. 1, 1959, and increases or decreases after that date are absorbed by the seller.

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

New Jersey, concentrates	nom.

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 65%	21.00
Brazilian iron ore, 68.5%	22.60

Tungsten Ore

Net ton, unit

Foreign wolframite, good commercial quality	$12.50-13.00*
Domestic, concentrates f.o.b. milling points	16.00-17.00†

*Before duty. †Nominal.

Manganese Ore

Mn 46-48%, Indian 91.5c-96.5c, nom. per long ton unit, c.i.f.. U. S. ports, duty for buyer's account.

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and Rhodesian

48% 3:1	$42.00-44.00†
48% 2.8:1	38.00-40.00†
48% no ratio	29.00-31.00†

South African Transvaal

44% no ratio	19.75-21.00
48% no ratio	29.00-31.00

Turkish

48% 3:1	51.00-55.00†

Domestic

Rail nearest seller

18% 3:1	39.00

Molybdenum

Sulfide concentrate, per lb of Mo content, mines, unpacked	$1.23

Antimony Ore

Per short ton unit of Sb content, c.i.f. seaboard

50-55%	$2.25-2.40
60-65%	2.50-3.10

Vanadium Ore

Cents per lb V_2O_5

Domestic	31.00

†Nominal.

Canadian Steel

(Cents per pound, f.o.b. mill, except as otherwise noted)

Billets, Blooms & Slabs:	
Carbon, Forging Quality (net ton)	$97.00
Alloy (net ton)	115.00
Wire Rods:	
Carbon, $\frac{7}{32}$" to under ¼ in.	5.30
Carbon, ¼ in. to 47/64 in.	5.70
Alloy	6.40
Wire (carload lots)	8.40
Bars & Small Shapes:	
Carbon, merchant quality	5.40
Carbon, special quality	5.85
Alloy	6.40
Bar Mill Bands:	
Carbon	5.40
Alloy	8.05
Structural Size Angles & Zees	5.40
Plates:	
Carbon	5.45
Sheets & Coils, Hot Rolled:	
Carbon Sheets	5.00
Carbon Strip	5.00
Sheets & Coils, Cold Rolled:	
Carbon Sheet	6.35
Carbon Strip (0.080 and lighter)	6.35
Carbon Strip (0.081 and heavier)	6.65
Sheets & Coils, Galvanized:	
Standard Quality	6.70
Culvert Quality	7.00
Sheets, Porcelain Enameling	7.45
Sheets & Coils, Electrical:	
Field Grade	9.00
Armature Grade	9.50
Electrical Grade	10.15
Tin Mill Products (Per Base Box; 100 lb basis wt)	
Coke Tin Plate (1.25 lb pot yield)	$10.60
Electrolytic Tin Plate (0.25 lb coating)	9.10
Black Plate	8.30
Nails, c.l. lots, 400 keg min. (per keg)	$8.15

Metal Powder

(Per pound f.o.b. shipping point in ton lots for minus 100 mesh, except as noted)

	Cents
Sponge Iron, domestic and foreign, 98% Fe, min. trucklots, freight allowed east of Mississippi River:	
100 mesh, bags	11.25
100 mesh, pails	9.10§
40 mesh, bags	8.10††
Electrolytic Iron, Melting stock, 99.87% Fe, irreg. fragments, ⅛ in. x 1.3 in.	28.75
1.3 in.	28.75
(In contract lots of 240 tons price is 22.75c)	
Annealed, 99.5% Fe	36.50
Unannealed (99+% Fe)	36.00
Unannealed (99+% Fe) (minus 325 mesh)	59.00
Powder Flake (minus 16, plus 100 mesh)	29.00
Carbonyl Iron: 98.1-98.9%, 3 to 20 microns, depending on grade, 93.00-290.00 in standard 200-lb containers; all minus 200 mesh.	
Aluminum: Atomized, 500-lb drum, freight allowed, cl. 38.50; ton lots 40.50.	
Antimony, 500-lb lots	42.00*
Brass, 5000-lb lots	34.50-51.00†
Bronze, 5000-lb lots	52.40-56.40†
Copper, electrolytic	14.25*
Copper, reduced	14.25*
Lead	7.50*
Manganese, Electrolytic: Minus 50 mesh	43.00
Nickel	80.60
Nickel-Silver, 5000-lb lots	53.00-57.30†
Phosphor-Copper, 5000-lb lots	64.80
Copper (atomized) 5000-lb lots	45.30
Solder	7.00*
Stainless Steel, 304	$0.89
Stainless Steel, 316	$1.07
Tin	14.00*
Zinc, 5000-lb lots	19.00-32.20‡
Tungsten:	Dollars
Carbon reduced, 98.8% min. minus 65 mesh	nom.**
Chromium, electrolytic 99.8% Cr, min metallic basis	5.00

*Plus cost of metal. †Depending on composition. ‡Depending on mesh. §Cutting and scarfing grade. **Depending on price of ore. ††Welding grade.

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, Pa., furnace	$14.75-15.25
Connellsville, Pa., foundry	18.00-18.50

Oven Foundry Coke

Birmingham, ovens	$30.35
Cincinnati, deld.	33.34
Buffalo, ovens	32.00
Detroit, ovens	32.00
Pontiac, Mich., deld.	33.95
Saginaw, Mich., deld.	35.53
Erie, Pa., ovens	32.00
Everett, Mass., ovens:	
New England, deld.	33.55*
Indianapolis, ovens	31.25
Ironton, Ohio, ovens	30.50
Cincinnati, deld.	33.54
Kearny, N. J., ovens	31.25
Milwaukee, ovens	32.00
Neville Island (Pittsburgh), Pa., ovens	30.75
Painesville, Ohio, ovens	32.00
Cleveland, deld.	34.19
Philadelphia, ovens	31.00
St. Louis, ovens	33.00
St. Paul, ovens	31.25
Chicago, deld.	34.73
Swedeland, Pa., ovens	31.00
Terre Haute, Ind., ovens	31.25

*Within $5.15 freight zone from works.

Imported Steel

(Base per 100 lb, landed, duty paid; based on current ocean rates with any rise for buyer's acc't. Source of shipment: Western Europe)

	North Atlantic	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A 305	$5.80	$5.75	$5.65	$6.11
Bar Size Angles	5.30	5.25	5.10	5.56
Structural Angles	5.68	5.63	5.53	5.98
I-Beams	5.31	5.31	5.21	5.65
Channels	5.26	5.26	5.16	5.60
Plates (basic bessemer)	5.65	5.60	5.50	5.96
Sheets, H.R.	8.30	8.30	8.10	8.60
Sheets, Galvanized, 20 Ga., 36 in. x 96 in.	9.52	9.47	9.37	9.83
Sheets, Galv. (in coils) 20 Ga., 48 in. wide	9.58	9.53	9.43	9.89
Sheets, C.R. (drawing quality)	8.75	8.75	8.60	9.12
Furring Channels, C.R., 1000 ft, ¾ x 0.30 lb per ft	25.76	25.64	25.64	26.51
Barbed Wire (†)	6.68	6.58	6.52	6.75
Merchant Bars	5.90	5.85	5.65	6.11
Hot-Rolled Bands	7.15	7.15	7.15	7.55
Wire Rods, Thomas Commercial No. 5	5.70	5.70	5.50	5.85
Wire Rods, O.H. Cold Heading Quality No. 5	6.30	6.30	6.20	6.55
Bright Common Wire Nails (§)	7.65	7.65	7.65	7.95

†Per 82 lb net reel. §Per 100-lb kegs, 20d nails and heavier.

Coal Chemicals

(Representative prices)

Cents per gal f.o.b. tank cars or tank trucks, plant.	
Pure benzene	31.00
Xylene, industrial grade	29.00
Creosote	24.00
Naphthalene, 78 deg	5.00
Toluene, one deg (del. east of Rockies)	25.00
Cents per lb, f.o.b. tank cars or tank trucks, deld.	
Phenol, 90 per cent grade	14.75
Per net ton bulk, f.o.b. cars or trucks, plant	
Ammonium sulfate, regular grade	$32.00

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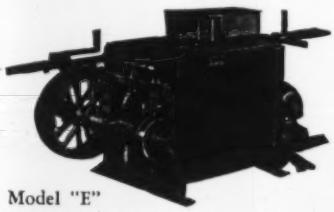

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*SOURCE: Iron Age Basic Marketing Data

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LOS ANGELES • NEWARK • NEW YORK
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Beaver Falls, Pa.

W 3

Ferroalloys

MANGANESE ALLOYS

Spiegeleisen: Carlot, per gross ton, Palmerton, Neville Island, Pa. 21-23% Mn, $105; 19-21% Mn, 1-3% Si, $102.50; 16-19% Mn, $100.50.

Standard Ferromanganese: (Mn 74-76%, C 7% approx) base price per net ton, $245, Johnstown, Duquesne, Sheridan, Neville Island, Pa.; Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Add or subtract $2 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively (Mn 79-81%). Lump $253 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

High-Grade Low-Carbon Ferromanganese: (Mn 85-95%). Carload, lump, bulk, max 0.07% C, 35.1c per lb of contained Mn, carload packed 36.4c, ton lots 37.9c, less ton 39.1c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices, 3c for max 0.03% C, 3.5c for max 0.5% C, and 6.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 96% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.25-1.5%, Si 1.5% max). Carload, lump, bulk, 25.5c per lb of contained Mn; packed, carload 26.8c, ton lot 28.4c, less ton 29.6c.

Electrolytic Manganese Metal: Min carload, bulk, 33.25c; 2000 lb to min carload, 36c; less ton, 38c; 50 lb cans, add 0.5c per lb. Premium for hydrogen-removed metal, 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or any point east of Mississippi River; or f.o.b. Marietta, O., freight allowed.

Silicomanganese: (Mn 65-68%). Carload, lump, bulk, 1.50% C grade, 18.5-21% Si, 12.8c per lb of alloy. Packed, c.l. 14c, ton 14.45c, less ton 15.45c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. For 2% C grade, Si 16-18.5%, deduct 0.2c from above prices. For 3% grade, Si 12.5-16%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lot, 2" x D, $1.50 per lb of contained Ti; less ton to 300 lb, $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lot $1.35, less ton to 300 lb $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract min c.l. $250 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi River and north of Baltimore and St. Louis. Spot $255.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4%). Contract, c.l. $300 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed. Spot, $305.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: C.l. lump, bulk, 28.75c per lb of contained Cr. Delivered.

Charge Chrome 1: Cr 63%, C 6% max, Si 7% max, 22c. Charge Chrome 2: Cr 50-59%, C 8% max, Si 6% max, 23c. Carload, lump, bulk, per lb Cr.

Refined Chrome 1: Cr 50-59%, C 5% max, Si 2% max, 25c. Refined Chrome 2: Si 12% max, 24c. Carload, lump, bulk, per lb Cr.

Low-Carbon Ferrochrome: Cr 63-66% (Simplex), carload, lump, bulk, C 0.025% max, 36.75c per lb contained Cr; 0.010% max, 37.75c. Delivered.

Cr 67-71%, carload, lump, bulk, 0.025% max, 39.75c; 0.05% max, 39.00c; 0.10% max, 38.50c; 0.20% max, 38.25c; 0.50% max, 38.00c; 1.0% max, 37.75c; 1.5% max, 37.50; 2.0% max, 37.25c. Delivered.

Foundry Ferrochrome, High-Carbon: (Cr 62-66%, C 5-7%, Si 7-10%). C.l., 2" x D, bulk 30.8c per lb of contained Cr. Packed, c.l. 32.4c, ton 34.2c, less ton 35.7c. Delivered. Spot, add 0.25c.

Foundry Ferrosilicon Chrome: (Cr 50-54%, Si 28-32%, C 1.25% max). 8M x D, carload bulk 20.05c per lb of alloy; carload packed, 21.25c, ton lot 22.50c; less ton lot 23.70c. Delivered. Spot, add 0.25c.

Ferrochrome-Silicon: Cr 39-41%, Si 42-45%, C 0.05% max or Cr 33-36%, Si 45-48%, C 0.05% max. Carload, lump, bulk, 3" x down and 2" x down, 28.25c per lb contained Cr, 14.60c per lb contained Si, 0.75" x down 29.40c per lb contained Cr, 14.60c per lb contained Si.

Chromium Metal, Electrolytic: Commercial grade (Cr 99.8% min, metallic basis, Fe 0.2% max). Contract, carlot, packed, 2" x D plate (about ⅛" thick) $1.15 per lb, ton lot $1.17, less ton lot $1.19. Delivered. Spot, add 5c.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth grade (V 50-55%, Si 8% max, C 3% max). Contract, any quantity, $3.20 per lb of contained V. Delivered. Spot, add 10c. **Special Grade:** (V 50-55% or 70-75%, Si 2% max, C 0.5% max) $3.30. **High Speed Grade:** (V 50-55% or 70-75%, Si 1.50% max, C 0.20% max) $3.40.

Grainal: Vanadium Grainal No. 1 $1.05 per lb; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lot, packed, $1.38 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

50% Ferrosilicon: Carload, lump, bulk, 14.6c per lb contained Si. Packed, c.l. 17.1c, ton lot 18.55c, less ton 20.20c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.45c to 50% ferrosilicon prices. **65% Ferrosilicon:** Carload, lump, bulk, 15.75c per lb contained silicon. Packed, c.l. 17.75c, ton lot 19.55c, less ton 20.9c. Delivered. Spot, add 0.35c.

75% Ferrosilicon: Carload, lump, bulk, 16.9c per lb of contained Si. Packed, c.l. 18.8c, ton lot 20.45c, less ton 21.7c. Delivered. Spot, add 0.3c.

90% Ferrosilicon: Carload, lump, bulk, 20c per lb of contained Si. Packed, c.l. 21.65c, ton lot 23.05c, less ton 24.1c. Delivered. Spot, add 0.25c.

Silicon Metal: (98% min Si, 1.00% max Fe, 0.07% max Ca). C.l. lump, bulk, 21.5c per lb of Si. Packed, c.l. 23.15c, ton lot 24.45c, less ton 25.45c. Add 0.5c for max 0.03% Ca grade. Add 0.5c for 0.50% Fe grade analyzing 98.25% min Si.

Alsifer: (Approx 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.85c per lb of alloy; ton lot, packed, 10.85c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, C 0.20% max). Contract, c.l. lump, bulk, 9.25c per lb of alloy. Packed, c.l. 10.45c, ton lot 11.6c, less ton 12.45c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Carload bulk 26.25c per lb of alloy, carload, lump, packed 27.25c, ton lot 28.4c, less ton 29.65c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: 100 lb or more packed (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy; less than 100 lb $1.30. Delivered. Spot, add 5c. F.o.b. Washington, Pa., prices, 100 lb and over are as follows: Grade A (10-14 % B) 85c per lb; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si). Carload, bulk, lump, or 3" x D, $5.25 per lb of contained B. Packed, carload $5.40, ton to c.l. $5.50, less ton $5.60. Delivered.

Carbortam: (B 1 to 2%). Lump, carload $320 per ton, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Carload, lump, bulk 23c per lb of alloy, caload packed 24.25c, ton lot 26.15c, less ton 27.15c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.5-3%). Carload, lump, bulk 24c per lb of alloy, carload packed 25.65c, ton lot 27.95c, less ton 29.45c. Delivered. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx 3¾ lb each and containing 2 lb of Cr). Carload, bulk 19.60c per lb of briquet, in bags 20.70c; 3000 lb to c.l. pallets 20.80c; 2000 lb to c.l. in bags 21.90c; less than 2000 lb in bags 22.80c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx 3 lb and containing 2 lb of Mn). Carload, bulk 14.8c per lb of briquet; c.l., packed, bags 16c; 3000 lb to c.l., pallets 16c; 2000 lb to c.l., bags 17.2c; less ton 18.1c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx 3½ lb and containing 2 lb of Mn and approx ½ lb of Si). C.l. bulk 15.1c per lb of briquet; c.l. packed, bags 16.3c, 3000 lb to c.l., pallets 16.3c; 2000 lb to c.l., bags 17.5c; less ton 18.4c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx 5 lb and containing 2 lb of Si and small sizes, weighing approx 2½ lb and containing 1 lb of Si). Carload, bulk 8c per lb or briquet; packed, bags 9.2c; 3000 lb to c.l., pallets 9.6c; 2000 lb to c.l.; bags 10.8c; less ton 11.7c. Delivered. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each). $1.49 per lb of Mo contained, f.o.b. Langeloth, Pa.

Titanium Briquets: Ti 98.27%, $1 per lb, f.o.b. Niagara Falls, N. Y.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%). 5000 lb W or more $2.15 per lb (nominal) of contained W. Delivered.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Si 8% max, C 0.1% max). Ton lots 2" x D, $3.45 per lb of contained Cb; less ton lots $3.50 (nominal). Delivered.

Ferrotantalum Columbium: (Cb 40% approx, Ta 20% approx, and Cb plus Ta 60% min, C 0.30% max). Ton lots 2" x D, $3.05 per lb of contained Cb plus Ta, delivered; less ton lots $3.10.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Carlot bulk 19.25c per lb of alloy, c.l. packed ½ in. x 12 M 20.00c, ton lot 21.15c, less ton 22.40c. Delivered. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 20c per lb of alloy, ton lot 21.15c; less ton lot 22.4c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 18.45c per lb of alloy; ton lot 19.95c; less ton lot 21.20c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

Simanal: (Approx 20% each Si, Mn, Al; bal Fe). Lump, carload, bulk 19.25c. Packed c.l. 20.25c, 2000 lb to c.l. 21.25c; less than 2000 lb 21.75c per lb of alloy. Delivered.

Ferrophosporus: (23-25% based on 24% P content with unitage of $5 for each 1% of P above or below the base). Carload, bulk, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $120 per gross ton.

Ferromolybdenum: (55-75%). Per lb of contained Mo in 200-lb container, f.o.b. Langeloth and Washington, Pa., $1.76 in all sizes except powdered which is $1.82.

Technical Molybdic-Oxide: Per lb of contained Mo., in cans, $1.47; in bags, $1.46, f.o.b. Langeloth and Washington, Pa.

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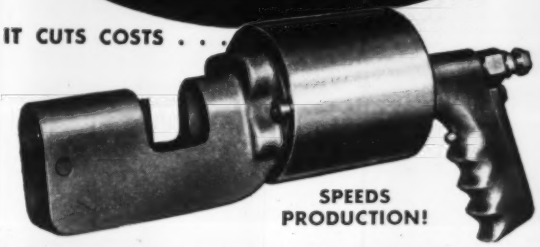

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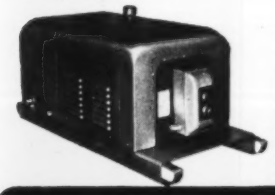

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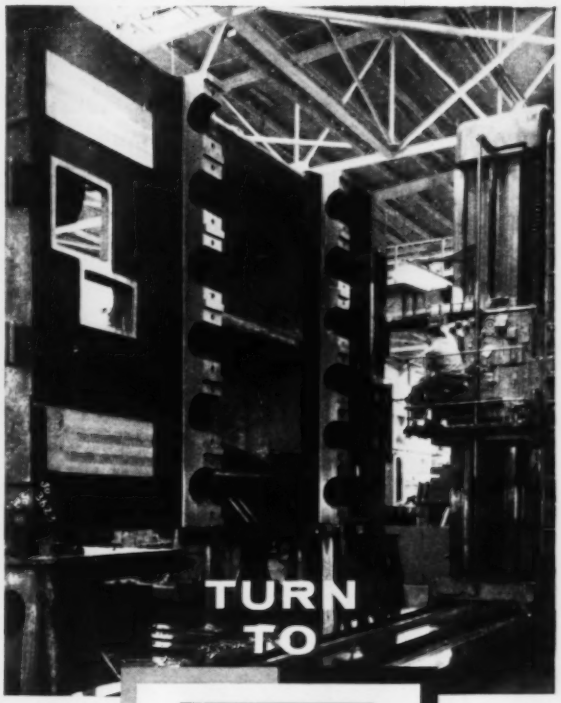

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Scrap Market Is Stronger

STEEL's composite on No. 1 heavy melting rises 34 cents to $33.67 on broker-dealer trading. Mill buying continues slow, pending outcome of steel labor contract negotiations

Scrap Prices, Page 140

• **Chicago**—The market is stronger on broker-dealer trading, and quotations are up $1 a ton across the board. A few items are up $2 a ton. It's the first general upward push in many weeks. If there is no strike next month, mills probably will operate close to capacity through July.

• **New York**—The market seems to have hit bottom and is rebounding some. Brokers' buying prices are up $1 a ton on No. 1 heavy melting at $27-$28; No. 1 bundles, $27-$28; and No. 2 bundles, $16-$17. Prices are unchanged on other grades, but they appear stronger.

• **Philadelphia**—Domestic business is at a virtual standstill, but good export volume continues. Some prices are up. No. 2 heavy melting is being quoted $30-$31, No. 2 bundles, $21, short shoveling turnings, $22-$23. Most dealers anticipate a steel strike, and they're depending heavily on export demand for support.

• **Pittsburgh** — The market seems to be gathering strength. Brokers predict bids on factory bundles from Fisher Body Div. of General Motors Corp. will be $2 higher than last month's. Dealers are optimistic because: 1. Mills think current prices are attractive. 2. They're beginning to show more interest as their inventories shrink. 3. They'll have to use more scrap if they start banking their blast furnaces in preparation for a midyear strike.

• **Cleveland**—Although there's not much activity in the market, sentiment is stronger. Brokers and dealers think prices have struck bottom. The immediate future trend is said to depend on automotive list bids. Relatively little buying is anticipated until steel labor contract uncertainties are removed.

• **Detroit**—The market is a little more bullish on the dealer level as auto lists close out. Expectations are that there will be a slight increase in prices, but the mills may be slow to place orders because of the strike threat. The feeling is that prices will go up a couple of dollars, then hold for several weeks.

• **Buffalo**—The recent decline in prices appears to have bottomed out. June orders are expected to be placed at current levels. Dealer scrap supplies have been reduced by the prolonged price decline. Industrial scrap continues to move in good volume.

• **Cincinnati** — The market is

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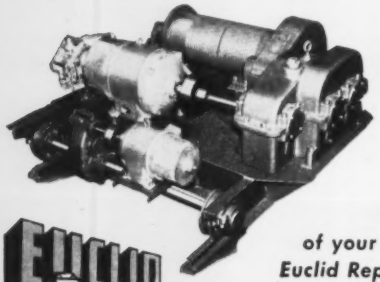
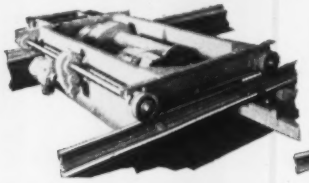
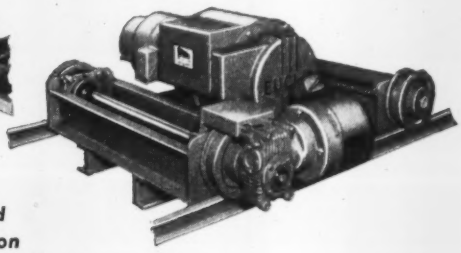


This submerged crane trolley is designed to meet the low headroom conditions which are more prevalent in existing low buildings today with the wide use of air conditioning in many industrial plants.



A Series "H" top running trolley with a worm gear drive used in double girder cranes in capacities of 3 to 15 tons.



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stronger. Prices on the principal steelmaking grades have moved up $1 a ton in brokers' buying lists, bringing No. 1 heavy melting to $32.50-$33.50. The increases reffect broker buying in anticipation of June orders from the mills; also, increased bidding on early industrial lists.

• **St. Louis**—The market is stronger. Although prices are little changed, it's said that mills probably will pay more for material than they have been offering the last few weeks.

• **Birmingham**—Brokers and dealers think prices will start to rise soon. Their optimism is based on recent higher priced railroad lists and a few sales. An electric furnace operator is reported to have bought 2 ft foundry steel at $2 above published quotations.

• **Houston** — Current mill orders run through June 15, but they've been covered. Export buying is at a virtual standstill. Mexican needs are being covered slowly in border areas. The intake of country scrap is off sharply. Industrial scrap is plentiful in Houston.

• **Seattle**—The market is sluggish. Japan has not renewed her buying on the West Coast, but scrap is reported being exported from North Atlantic and Gulf ports.

• **San Francisco**—The steel scrap market is slow. Uncertainty about summer steelmaking operations is holding down buying. Pending settlement of contract negotiations, dealers expect a sluggish market.

• **Los Angeles**—Mills are expected to cut their offering prices $3 to $4 a ton during the next few weeks. They will cut off intake after June 15. Yard inventories are expected to rise.

Iron Ore . . .

Iron Ore Prices, Page 134

Labrador iron ore is moving to midwestern mills in bigger volume now that the St. Lawrence Seaway permits passage of larger vessels into the Great Lakes.

Two large shipments for Youngstown Sheet & Tube Co., Youngstown, arrived at Cleveland recently in the bulk carriers *Westriver* and *Alexander T. Wood*. Both vessels, on their maiden trips into the lakes, carried a total of 21,100 tons of ore.

A cargo of 19,000 tons is scheduled to arrive at Ashtabula, Ohio, early this month.

Blast Furnace Production Declines During April

Blast furnace production (pig iron and ferroalloys) in April totaled 7,392,606 net tons, reports the American Iron & Steel Institute. That compares with 7,510,051 tons in March, and 3,827,209 tons in April, 1958. Of the total in April, 54,234 tons were ferromanganese and spiegeleisen compared with 48,291 in March and 39,302 in April, 1958.

Total production in the first four months this year was 27,355,724 net tons (196,371 tons of ferroalloys) vs. 17,208,541 tons (200,392 ferroalloys) in the like period of 1958.

The breakdown of production by states:

Blast Furnace Production

(Net Tons)

By states:	April	Year to Date
Massachusetts, New York	460,290	1,699,042
Pennsylvania	1,986,065	7,126,881
Maryland, Virginia, West Virginia	623,039	2,365,612
Kentucky, Tennessee, Texas	151,906	614,013
Alabama	413,885	1,534,642
Ohio	1,430,446	5,182,406
Indiana	838,361	3,259,350
Illinois	621,818	2,317,613
Michigan, Minnesota	464,384	1,768,447
Colorado, Utah, California	402,412	1,487,718
Totals	7,392,606*	27,355,724**

*Includes 54,234 tons of ferromanganese and spiegeleisen.
**Includes 196,371 tons of ferromanganese and spiegeleisen.
Data from American Iron & Steel Institute.

Pig Iron . . .

Pig Iron Prices, Page 133

Pig iron consumers are not showing the concern over supplies that is reported by steel users. Merchant iron users know that producers have substantial inventories and that foreign sources can provide additional tonnages.

Most merchant iron customers are gearing their purchases to incoming orders for castings. Many shops are operating on reduced workweeks, although reporting a slight improvement in business.

Stocks of pig iron held by consumers at the end of March totaled 3,169,000 gross tons, reports the U. S. Bureau of Mines. Comparison: Stocks were 3,296,182 tons at the end of February.

Pig iron consumption during March reached an all-time high at 6,809,000 tons. It was 5 per cent greater than in January, 1957, the previous record month.

Imports of pig iron in February totaled 5514 net tons, valued at $307,143. Imports in the first two months of the year were 10,926 tons, valued at $604,388.

February imports came from:

(*Please turn to Page* 146)

Iron and Steel Scrap

Consumer prices per gross ton, except as otherwise noted, including brokers' commission, as reported to STEEL, May 27, 1959. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

May 27	$33.67
May 20	33.33
Apr. Avg.	34.96
May 1958	33.21
May 1954	28.00

Based on No. 1 heavy melting grade at Pittsburgh, Chicago, and eastern Pennsylvania.

PITTSBURGH

No. 1 heavy melting	34.00-35.00
No. 2 heavy melting	30.00-31.00
No. 1 dealer bundles	38.00-39.00
No. 2 bundles	25.00-26.00
No. 1 busheling	*38.00-39.00*
No. 1 factory bundles	42.00-43.00
Machine shop turnings	19.00-20.00
Mixed borings, turnings	19.00-20.00
Short shovel turnings	24.00-25.00
Cast iron borings	24.00-25.00
Cut structurals:	
2 ft and under	43.00-44.00
3 ft lengths	42.00-43.00
Heavy turnings	30.00-31.00
Punchings & plate scrap	*45.00-46.00*
Electric furnace bundles	42.00-43.00

Cast Iron Grades

No. 1 cupola	45.00-46.00
Stove plate	45.00-46.00
Unstripped motor blocks	32.00-33.00
Clean auto cast	46.00-47.00
Drop broken machinery	51.00-52.00

Railroad Scrap

No. 1 R.R. heavy melt.	39.00-40.00
Rails, 2 ft and under	54.00-55.00
Rails, 18 in. and under	55.00-56.00
Random rails	48.00-49.00
Angles, splice bars	48.00-49.00
Railroad specialties	47.00-48.00
Rails, rerolling	61.00-62.00

Stainless Steel Scrap

18-8 bundles & solids	220.00-225.00
18-8 turnings	115.00-120.00
430 bundles & solids	120.00-125.00
430 turnings	55.00-65.00

CHICAGO

No. 1 hvy melt., indus.	*35.00-36.00*
No. 1 hvy melt., dealer	*32.00-33.00*
No. 2 heavy melting	*30.00-31.00*
No. 1 factory bundles	*40.00-41.00*
No. 1 dealer bundles	*33.00-34.00*
No. 2 bundles	*24.00-25.00*
No. 1 busheling, indus.	*35.00-36.00*
No. 1 busheling, dealer	*32.00-33.00*
Machine shop turnings	*17.00-18.00*
Mixed borings, turnings	*19.00-20.00*
Short shovel turnings	*19.00-20.00*
Cast iron borings	*19.00-20.00*
Cut structurals, 3 ft	*42.00-43.00*
Punchings & plate scrap	*43.00-44.00*

Cast Iron Grades

No. 1 cupola	*49.00-50.00*
Stove plate	*46.00-47.00*
Unstripped motor blocks	*41.00-42.00*
Clean auto cast	*56.00-57.00*
Drop broken machinery	*56.00-57.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*38.00-39.00*
R.R. malleable	*59.00-60.00*
Rails, 2 ft and under	*54.00-55.00*
Rails, 18 in. and under	*55.00-56.00*
Angles, splice bars	*48.00-49.00*
Axles	*64.00-65.00*
Rails, rerolling	*57.00-58.00*

Stainless Steel Scrap

18-8 bundles & solids	*215.00-220.00*
18-8 turnings	*115.00-120.00*
430 bundles & solids	115.00-120.00
430 turnings	55.00-60.00

YOUNGSTOWN

No. 1 heavy melting	*37.00-38.00*
No. 2 heavy melting	26.00-27.00
No. 1 busheling	*37.00-38.00*
No. 1 bundles	*37.00-38.00*
No. 2 bundles	23.00-24.00
Machine shop turnings	17.00-18.00
Short shovel turnings	22.00-23.00
Cast iron borings	22.00-23.00
Low phos	38.00-39.00
Electric furnace bundles	*40.00-41.00*

Railroad Scrap

No. 1 R.R. heavy melt.	38.00-39.00

CLEVELAND

No. 1 heavy melting	*35.00-36.00*
No. 2 heavy melting	24.00-25.00
No. 1 factory bundles	*39.00-40.00*
No. 1 bundles	*35.00-36.00*
No. 2 bundles	24.00-25.00
No. 1 busheling	*35.00-36.00*
Machine shop turnings	14.00-15.00
Short shovel turnings	20.00-21.00
Mixed borings, turnings	20.00-21.00
Cast iron borings	20.00-21.00
Cut foundry steel	35.00-36.00
Cut structurals, plates 2 ft and under	42.00-43.00
Low phos. punchings & plate	*36.50-37.50*
Alloy free, short shovel turnings	22.00-23.00
Electric furnace bundles	*36.50-37.50*

Cast Iron Grades

No. 1 cupola	47.00-48.00
Charging box cast	38.00-39.00
Heavy breakable cast	38.00-39.00
Stove plate	44.00-45.00
Unstripped motor blocks	33.00-34.00
Brake shoes	36.00-37.00
Clean auto cast	50.00-51.00
Burnt cast	37.00-38.00
Drop broken machinery	50.00-51.00

Railroad Scrap

R.R. malleable	65.00-66.00
Rails, 2 ft and under	57.00-58.00
Rails, 18 in. and under	58.00-59.00
Rails, random lengths	52.00-53.00
Cast steel	46.00-47.00
Railroad specialties	48.00-49.00
Uncut tires	42.00-43.00
Angles, splice bars	51.00-52.00
Rails, rerolling	58.00-59.00

Stainless Steel

(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	215.00-220.00
18-8 turnings	110.00-115.00
430 clips, bundles, solids	115.00-125.00
430 turnings	45.00-55.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	33.00
No. 2 heavy melting	31.00
No. 1 bundles	37.00
No. 2 bundles	21.00
No. 1 busheling	37.00
Machine shop turnings	12.50
Short shovel turnings	14.00

Cast Iron Grades

No. 1 cupola	49.00
Charging box cast	42.00
Heavy breakable cast	40.00
Unstripped motor blocks	41.00
Clean auto cast	50.00
Stove plate	45.50

Railroad Scrap

No. 1 R.R. heavy melt.	37.00
Rails, 18 in. and under	49.00
Rails, random lengths	*42.50*
Rails, rerolling	*51.00†*
Angles, splice bars	44.00†

BIRMINGHAM

No. 1 heavy melting	28.00-29.00
No. 2 heavy melting	21.00-22.00
No. 1 bundles	28.00-29.00
No. 2 bundles	21.00-22.00
No. 1 busheling	28.00-29.00
Cast iron borings	14.00-15.00
Machine shop turnings	20.00-21.00
Short shovel turnings	21.00-22.00
Bars, crops and plates	38.00-39.00
Structurals & plates	38.00-39.00
Electric furnace bundles	34.00-35.00
Electric furnace:	
2 ft and under	33.00-34.00
3 ft and under	32.00-33.00

Cast Iron Grades

No. 1 cupola	53.00-54.00
Stove plate	53.00-54.00
Charging box cast	29.00-30.00
Unstripped motor blocks	40.00-41.00
No. 1 wheels	39.00-40.00

Railroad Scrap

No. 1 R.R. heavy melt.	33.00-34.00
Rails, 18 in. and under	48.00-49.00
Rails, rerolling	52.00-53.00†
Rails, random lengths	40.00-41.00
Angles, splice bars	42.00-43.00

PHILADELPHIA

No. 1 heavy melting	33.00-34.00
No. 2 heavy melting	*30.00-31.00*
No. 1 bundles	36.00-37.00
No. 2 bundles	*21.00*
No. 1 busheling	35.00-36.00
Electric furnace bundles	38.00-39.00
Mixed borings, turnings	20.00†
Short shovel turnings	*22.00-23.00*
Machine shop turnings	20.00
Heavy turnings	32.00-33.00
Structurals & plate	40.00-42.00
Couplers, springs, wheels	42.00-43.00
Rail crops, 2 ft & under	58.00-60.00

Cast Iron Grades

No. 1 cupola	41.00
Heavy breakable cast	42.00
Drop broken machinery	49.00-50.00
Malleable	67.00-68.00

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	*27.00-28.00*
No. 2 heavy melting	24.00-25.00
No. 1 bundles	*27.00-28.00*
No. 2 bundles	*16.00-17.00*
Machine shop turnings	9.00-10.00†
Mixed borings, turnings	12.00-13.00
Short shovel turnings	13.00-14.00
Low phos. (structurals & plates)	35.00-36.00

Cast Iron Grades

No. 1 cupola	36.00-37.00
Unstripped motor blocks	24.00-25.00
Heavy breakable	34.00-35.00

Stainless Steel

18-8 sheets, clips, solids	195.00-200.00
18-8 borings, turnings	85.00-90.00
410 sheets, clips, solids	55.00-60.00
430 sheets, clips, solids	85.00-90.00

BUFFALO

No. 1 heavy melting	31.00-32.00
No. 2 heavy melting	26.00-27.00
No. 1 bundles	31.00-32.00
No. 2 bundles	21.00-22.00
No. 1 busheling	31.00-32.00
Mixed borings, turnings	18.00-19.00
Machine shop turnings	16.00-17.00
Short shovel turnings	20.00-21.00
Cast iron borings	18.00-19.00
Low phos structurals and plate, 2 ft. and under	41.00-42.00

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	44.00-45.00
No. 1 machinery	48.00-49.00

Railroad Scrap

Rails, random lengths	43.00-44.00
Rails, 3 ft and under	49.00-50.00
Railroad specialties	41.00-42.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*32.50-33.50*
No. 2 heavy melting	*27.50-28.50*
No. 1 bundles	*32.50-33.50*
No. 2 bundles	*21.00-22.00*
No. 1 busheling	*32.50-33.50*
Machine shop turnings	15.00-16.00
Mixed borings, turnings	15.00-16.00
Short shovel turnings	17.00-18.00
Cast iron borings	16.50-17.50
Low phos., 18 in.	*41.00-42.00*

Cast Iron Grades

No. 1 cupola	*45.00-46.00*
Heavy breakable cast	39.00-40.00
Charging box cast	38.00-39.00
Drop broken machinery	*49.00-50.00*

Railroad Scrap

No. 1 R.R. heavy melt.	37.00-38.00
Rails, 18 in. and under	53.00-54.00
Rails, random lengths	46.00-47.00

HOUSTON

(Brokers' buying prices; f.o.b. cars)

No. 1 heavy melting	34.00
No. 2 heavy melting	31.00
No. 1 bundles	34.00
No. 2 bundles	20.00
Machine shop turnings	17.00
Short shovel turnings	20.00
Low phos. plates & structurals	41.00

Cast Iron Grades

No. 1 cupola	43.00
Heavy breakable	27.00-28.00†
Foundry malleable	37.00
Unstripped motor blocks	35.00

Railroad Scrap

No. 1 R.R. heavy melt.	34.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	24.00
No. 2 heavy melting	20.00-20.50
No. 1 bundles	24.00-24.50
No. 1 busheling	24.00-24.50
Machine shop turnings	8.00-9.00
Short shovel turnings	10.00-11.00
No. 1 cast	33.00
Mixed cupola cast	33.00
No. 1 machinery cast	34.00

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*30.00-31.00*
No. 2 heavy melting	*20.00-21.00*
No. 1 bundles	*32.00-33.00*
No. 2 bundles	*19.00-20.00*
No. 1 busheling	*30.00-31.00*
Machine shop turnings	*12.00-13.00*
Mixed borings, turnings	*13.00-14.00*
Short shovel turnings	*13.00-14.00*

Cast Iron Grades

No. 1 cupola	*44.00-45.00*
Stove plate	*33.00-34.00*
Charging box cast	*34.00-35.00*
Heavy breakable	*34.00-35.00*
Unstripped motor blocks	*22.00-23.00*
Clean auto cast	*47.00-48.00*

SEATTLE

No. 1 heavy melting	*35.00*
No. 2 heavy melting	*33.00*
No. 1 bundles	27.00†
No. 2 bundles	*22.00*
Machine shop turnings	17.00
Mixed borings, turnings	17.00
Electric furnace No. 1	38.00†

Cast Iron Grades

No. 1 cupola	34.00
Heavy breakable cast	28.00†
Unstripped motor blocks	26.00
Stove plate (f.o.b. plant)	21.00†

LOS ANGELES

No. 1 heavy melting	38.00
No. 2 heavy melting	36.00
No. 1 bundles	35.00
No. 2 bundles	18.00
Machine shop turnings	17.00
Shoveling turnings	19.00
Cast iron borings	19.00
Cut structurals and plate 1 ft and under	49.00

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	47.00

Railroad Scrap

No. 1 R.R. heavy melt.	41.00

SAN FRANCISCO

No. 1 heavy melting	36.00
No. 2 heavy melting	33.00
No. 1 bundles	34.00
No. 2 bundles	22.00
Machine shop turnings	16.00
Mixed borings, turnings	16.00
Cast iron borings	16.00
Heavy turnings	16.00
Short shovel turnings	16.00
Cut structurals, 3 ft	42.00

Cast Iron Grades

No. 1 cupola	44.00
Charging box cast	34.00
Stove plate	34.00
Heavy breakable cast	28.00
Unstripped motor blocks	31.00
Clean auto cast	40.00
Drop broken machinery	40.00
No. 1 wheels	34.00

HAMILTON, ONT.

(Brokers' buying prices)

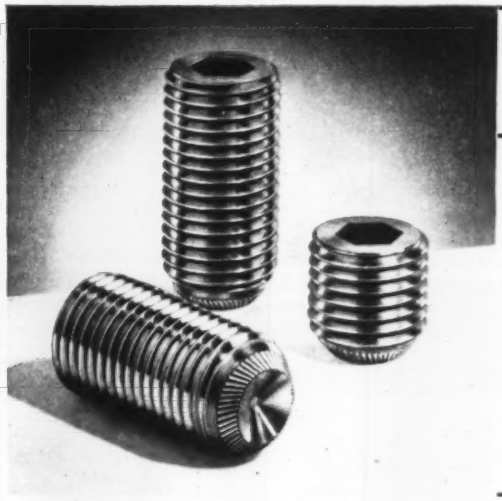
No. 1 heavy melting	32.25
No. 2 heavy melting	28.25
No. 1 bundles	32.25
No. 2 bundles	22.75
Mixed steel scrap	24.25
Mixed borings, turnings	13.00
Busheling, new factory: Prepared	32.25
Unprepared	26.25
Short steel turnings	17.00

Cast Iron Grades‡

No. 1 machinery cast	46.50-48.00

†Nominal.
‡F.o.b. Hamilton, Ont.

SPS RELIABILITY / *A dynamic standard of predictable performance*



RECOMMENDED SOCKET SET SCREW TIGHTENING TORQUES

Screw Size	Unbrako (in.-lb.)	Set Screw B (in.-lb.)	Set Screw C (in.-lb.)	Minimum Differential %
#4	5	3.9	3.5	28
#5	9	7.8	7.4	15
#6	9	7.8	7.4	15
#8	20	14.7	14.5	36
#10	33	26.5	25	25
1/4	87	62	60	40
5/16	165	122	125	32
3/8	290	198	225	29
7/16	430	309	350	23
1/2	620	460	500	24
5/8	1225	1106	1060	11
3/4	2125	1540	1800	18
7/8	5000	3660	4600	9
1	7000	5025	6500	8

High torque UNBRAKO socket sets are available as follows: Sizes, #0 through 1 in.; materials, alloy steel and 18-8 stainless steel; Types, plain cup point (microsizes and stainless)—self-locking with knurled cup point (#4 through 1 in.)—self-locking with Nylok (plain cup point).

High Torque UNBRAKO socket set screws have up to 40% more holding power

Holding power—a vital factor in the selection and application of a set screw—is the result of the seating force developed by tightening the screw. Invariably the tighter a screw is wrenched into place, the greater will be the holding power. Recommended seating torques for High Torque UNBRAKO socket set screws are up to 40% higher than those for ordinary socket set screws. And the cup point, knurled counterclockwise, resists their backing out under vibration.

In addition to greater holding power, dimensional accuracy of length and OD, with consistent physical and mechanical properties from lot to lot, makes high torque UNBRAKO socket screws ideal for automation. Major diameters are held strictly to Class 3A thread tolerance to permit automatic feeding without jam-up. Socket depth and size are highly uniform to permit the driver to engage the socket in a split second and drive the screw home with speed and precision. Threads are fully formed to Class 3A fit to make the whole screw stronger and provide accurate mating. Heat treatment, in atmosphere controlled furnaces, prevents decarburization and provides hardness and strength for long wear.

High torque UNBRAKO socket set screws are stocked by authorized SPS industrial distributors. Ask the one nearest you for complete details. Or write SPS—manufacturer of precision threaded industrial fasteners and allied products in many metals, including titanium. Unbrako Socket Screw Division, STANDARD PRESSED STEEL CO., Jenkintown 33, Pa.

SPS **Jenkintown • Pennsylvania**

Standard Pressed Steel Co. • The Cleveland Cap Screw Co. • Columbia Steel Equipment Co. • National Machine Products Co. • Nutt-Shel Co. • SPS Western • Standco Canada Ltd. • Unbrako Socket Screw Co., Ltd.

Alloy Zinc Prices Rise

Import quotas are back of the move since they've resulted in the drying up of discount metal. Molybdenum output down in 1958. Aluminum production goes up more

Nonferrous Metal Prices, Pages 144 & 145

IF THERE have been any doubts about the growing confidence in the recovery of the zinc market, recent moves that hiked the price of diecasting alloy grades 0.5 cent a pound should dispel them. In probably no other area had price cutting been so violent.

What was surprising: The move was initiated by the small independents and followed without a murmur by the large suppliers, who in most cases not only sell special high grade zinc to the independents but make their own alloys for direct sale to diecasters.

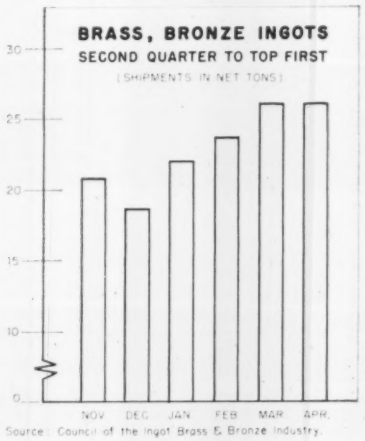
• **Behind the Scenes**—The independents went up because they were making barely enough profits to stay in business. The margin between what they paid for special high grade zinc and the alloy prices had steadily narrowed. In addition, the alloyers were faced with such costs as freight for shipments to customers, melting expenses, and the aluminum and magnesium that have to be purchased for alloying.

Producers had been selling zinc to the alloyers at a discount, but the discount zinc has been drying up lately. The only answer, say metalmen, was to raise prices.

• **Significance**—The basic cause behind the strengthening in the alloy market can be traced to our import quotas which are beginning to be felt. A great deal of zinc metal formerly entering the U. S. was special high grade. With less foreign metal available, competition in special high grade has lessened.

Producers say special high grade sales are holding up well. This is particularly encouraging to them since demand generally begins to taper off at this time of year.

In fact, there's a healthy tone to the entire zinc market. Output and demand in this country are almost in balance. If the threat of a steel strike weren't overhanging the market, prices would undoubtedly rise.



Source: Council of the Ingot Brass & Bronze Industry

But the threat's there, and the consensus is quotations will hold steady until there's either a strike or a settlement.

Molybdenum Output Off

Domestic production of molybdenum dropped to a seven year low of 41 million lb last year, a decline of 32 per cent from 1957, reports the U. S. Bureau of Mines.

The blame can be pinned on the general business decline. It caused: 1. A 19 per cent drop in domestic molybdenum consumption which resulted in operational cutbacks. 2. A strike that tied up production of the largest producer. 3. Curtailments at copper facilities where molybdenum is a byproduct.

The big villain in 1958 was the decline in alloy steel output where the bulk of the metal eventually winds up. Producers say molybdenum's recovery this year will parallel that of alloy steels.

More Aluminum Comes in

U. S. primary aluminum production continues to surge upward. Latest increase is by Kaiser Aluminum & Chemical Corp. which has started up the fourth and last potline in the current construction phase of its Ravenswood, W. Va., works. STEEL estimates that the addition of this line, with a 36,250 ton a year capacity, brings the annual operating rate to 1,969,500 tons.

R. S. Reynolds Jr., president of Reynolds Metals Co., believes the industry should establish records in both production and commercial sales this year. He says primary output will come close to the government's forecast of 1.9 million tons (STEEL thinks it may break this figure—see May 25, p. 196). First half commercial shipments should total close to 1,150,000 tons, over 40 per cent higher than a year ago, due in part to "inventory buildups as a hedge against possible work stoppages in the third quarter." Mr. Reynolds sees second half sales running as good as the first, bringing total commercial shipments to about 2.3 million tons, besting the record of 2,050,000 tons set in 1956.

NONFERROUS PRICE RECORD

	Price May 27	Last Change	Previous Price	Apr. Avg	Mar. Avg	May, 1958 Avg
Aluminum	24.70	Aug. 1, 1958	24.00	24.700	24.700	24.000
Copper	31.50-32.00	Apr. 30, 1959	31.50-32.50	32.404	32.031	24.433
Lead	11.80	May 7, 1959	11.30	10.992	11.238	11.512
Magnesium	35.25	Aug. 13, 1956	33.75	35.250	35.250	35.250
Nickel	74.00	Dec. 6, 1956	64.50	74.000	74.000	74.000
Tin	103.50	May 22, 1959	103.25	102.490	103.000	94.510
Zinc	11.00	Feb. 25, 1959	11.50	11.000	11.000	10.000

Quotations in cents per pound based on: COPPER, mean of primary and secondary, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary pig, 99.5+%, f.o.b. shipping point; MAGNESIUM, pig 99.8%, Velasco, Tex.

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AT THE CONVENTION . . .

Jeanne Darr, singing comedienne

JOIN US AT THE UDYLITE HOSPITALITY CENTER for Cocktails on Monday, Tuesday and Thursday, June 15, 16 and 18 from four to six p.m. . . . Michigan Room of the Statler Hilton Hotel, Detroit. Entertainment will feature Jeanne Darr and Elena Santa.

BE SURE YOU DO NOT MISS THE UDYLITE-AES BALL . . .

in the beautiful Terrace Room of the Statler Hilton, Thursday evening June 18, 10 P.M. to 2 A.M. Rollicking entertainment will be supplied by the Fenby-Carr quintet known across the country as the Singing Schoolteachers. BE THERE!

Fenby—Carr quintet

AT THE EXPOSITION . . .

See Udylite's exciting and unusual display, a truly unique presentation of the most complete and advanced developments in equipment, supplied and services . . . graphically displayed in a manner that will put you "right on top" of the metal finishing picture. Here presented in a striking manner and full of surprises is an entire industry—on Parade.

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AT THE
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Learn about the latest developments in modern metal finishing . . . *see Udylite!*
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Nonferrous Metals

Cents per pound, carlots except as otherwise noted.

PRIMARY METALS AND ALLOYS

Aluminum: 99.5%, pigs, 24.70; ingots, 26.80, 30,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 28.60; No. 43, 28.40; No. 195, 29.40; No. 214, 30.20; No. 356, 28.60; 30 or 40 lb ingots.

Antimony: R.M.M. brand, 99.5%, 29.00; Lone Star brand, 29.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 24.50-25.00, New York, duty paid, 10,000 lb or more.

Beryllium: 97% lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $74.75 per lb of contained Be, with balance as Al at market price, f.o.b. shipping point.

Beryllium Copper: 3.75-4.75% Be, $43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. shipping point.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.30 per lb deld.

Cobalt: 97.99%, $1.75 per lb for 500-lb keg, $1.77 per lb for 100 lb case; $1.82 per lb under 100 lb.

Columbium: Powder, $55-85 per lb, nom.

Copper: Electrolytic, 31.50 deld.; custom smelters, 32.00; lake, 31.50 deld.; fire refined, 31.25 deld.

Germanium: First reduction, less than 1 kg, 41.00 per gram; 1-10 kg, 37.00 per gram; intrinsic grade, 35.00-37.00 per gram.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $75-80 nom. per troy oz.

Lead: Common, 11.80; chemical, 11.90; corroding, 11.90, St. Louis, New York basis, add 0.20.

Lithium: 1 lb or 2 lb ingots, less than 100 lb, $11 per lb; 100-500 lb, $9.50 per lb; 500 lb or more, $9 per lb. All prices deld.

Magnesium: Pig, 35.25; ingot, 36.00 f.o.b. Velasco, Tex.; 12 in. sticks, 59.00 f.o.b. Madison, Ill.

Magnesium Alloys: AZ91A (diecasting), 40.75 deld.; AZ63A, AZ92A, AZ91C (sand casting), 40.75, f.o.b. Velasco, Tex.

Mercury: Open market, spot, New York, $244-247 per 76 lb flask.

Molybdenum: Unalloyed, turned extrusion, 3.75-5.75 in. round, $9.60 per lb in lots of 2500 lb or more, f.o.b. Detroit.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 74.00; 10-lb pigs, unpacked, 78.25; "XX" nickel shot, 79.50; "F" nickel shot for addition to cast iron, 74.50; "F" nickel, 5 lb ingots in kegs for addition to cast iron, 75.50. Prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 1.01. Nickel oxide sinter at Buffalo, New York, or other established U. S. points of entry, contained nickel, 69.60.

Osmium: $70-100 per troy oz nom.

Palladium: $18-20 per troy oz.

Platinum: $77-80 per troy oz from refineries.

Radium: $16-21.50 per mg radium content, depending on quantity.

Rhodium: $122-125 per troy oz.

Ruthenium: $55-60 per troy oz.

Selenium: $7.00 per lb, commercial grade.

Silver: Open market, 91.375 per troy oz.

Sodium: Solid pack, c.l., 19.50; l.c.l., 20.00; brick, c.l., 21.00; l.c.l., 21.50; tank car, 17.00.

Tantalum: Rod, $60 per lb; sheet, $55 per lb.

Tellurium: $2.00-2.20 per lb.

Thallium: $7.50 per lb.

Tin: Straits, N. Y., spot and prompt, 103.50.

Titanium: Sponge, 99.3 + % grade A-1, ductile (0.3% Fe max.), $1.62-1.82; grade A-2 (0.5% Fe max.), $1.70 per lb.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots, $2.75-2.90 per lb nom., f.o.b. shipping point; less than 1000 lb, add 15.00; 99 + % hydrogen reduced, $3.30-3.80.

Zinc: Prime western, 11.00; brass special, 11.25; intermediate, 11.50, East St. Louis, freight allowed over 0.50 per lb, New York basis, add 0.50. High grade, 12.00; special high grade, 12.25 deld. Diecasting alloy ingot No. 3, 14.00; No. 2, 14.50; No. 5, 14.25 deld.

Zirconium: Reactor grade sponge, 100 lb or less, $7 per lb; 100-500 lb, $6.50 per lb; over 500 lb, $6 per lb.

(Note: Chromium, manganese, and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 24.875-26.25; No. 12 foundry alloy (No. 2 grade), 22.75-23.00; 5% silicon alloy, 0.60 Cu max., 24.75-25.00; 13 alloy, 0.60 Cu max., 24.75-25.00; 195 alloy, 26.25-27.00; 108 alloy, 23.25-23.50. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 23.75; grade 2, 22.50; grade 3, 21.25; grade 4, 20.75.

Brass Ingot: Red brass No. 115, 30.25; tin bronze, No. 225, 41.25; No. 245, 35.00; high-leaded tin bronze, No. 305, 34.50; No. 1 yellow, No. 405, 24.75; manganese bronze, No. 421, 27.75.

Magnesium Alloy Ingot: AZ63A, 37.50; AZ91B, 37.50; AZ91C, 41.25; AZ92A, 37.50.

NONFERROUS PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb; nom. 1.9% Be alloy.) Strip, $1.91, f.o.b. Temple, Pa., or Reading, Pa.; rod, bar, wire, $1.89, f.o.b. Temple, Pa.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 20,000-lb lots, 36.855; l.c.l., 37.48. Weatherproof, 20,000-lb lots, 37.42; l.c.l., 38.17.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more, $17.50 per cwt; pipe, full coils, $17.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill.) Sheet and strip, $7.25-17.00; sheared mill plate, $5.25-10.00; wire, $5.75-10.00; forging billets, $3.55-5.75; hot-rolled and forged bars, $4.25-7.50.

(Prices per lb, c.l., f.o.b. mill.) Sheets, 26.00; ribbon zinc in coils, 21.50; plates, 20.00.

ZIRCONIUM

Plate, $12.50-19.20; H.R. strip, $12.50-22.90; C.R. strip, $15.90-31.25; forged or H.R. bars, $11.00-17.40.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheets, C.R.	126	106	128
Strip, C.R.	124	108	138
Plate, H.R.	120	105	121
Rod, Shapes, H.R.	107	89	109
Seamless Tubes	157	129	200

ALUMINUM

Sheets: 1100, 3003 and 5005 mill finish (30,000 lb base; freight allowed).

Thickness Range Inches	Flat Sheet	Coiled Sheet
0.250-0.136	42.80-47.30	.....
0.136-0.096	43.20-48.30	.....
0.126-0.103	.....	39.20-39.80
0.096-0.077	43.80-50.00	39.30-40.00
0.077-0.068	44.30-52.20	.....
0.077-0.061	.....	39.50-40.70
0.068-0.061	44.30-52.20	.....
0.061-0.048	44.90-54.40	40.10-41.80
0.048-0.038	45.40-57.10	40.60-43.20
0.038-0.030	45.70-62.00	41.00-45.70
0.030-0.024	46.20-53.70	41.30-45.70
0.024-0.019	46.90-56.80	42.40-44.10
0.019-0.017	47.70-54.10	43.00-44.70
0.017-0.015	48.60-55.00	43.80-45.50
0.015-0.014	49.60	44.80-46.50
0.014-0.012	50.80	45.50
0.012-0.011	51.00	46.70
0.011-0.0095	53.50	48.10
0.0095-0.0085	54.60	49.60
0.0085-0.0075	56.20	50.80
0.0075-0.007	57.70	52.30
0.007-0.006	59.30	53.70

ALUMINUM (continued)

Plates and Circles: Thickness 0.250-3 in. 24-60 in. width or diam., 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	42.40	47.20
5050-F	43.50	48.30
3004-F	44.50	50.20
5052-F	45.10	50.90
6061-T6	45.60	51.70
2024-T4	49.30	56.10
7075-T6*	57.60	64.70

*24-48 in. width or diam., 72-180 in. lengths.

Screw Machine Stock: 30,000 lb base.

Diam.(in.)or across flats*	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
0.125	76.90	73.90	.....	.....
0.250	62.00	60.20	89.10	76.60
0.375	61.20	60.00	73.50	68.50
0.500	61.20	60.00	73.50	68.50
0.625	61.20	60.00	69.80	64.20
0.750	59.70	58.40	63.60	60.40
0.875	59.70	58.40	63.60	60.40
1.000	59.70	58.40	63.60	60.40
1.125	57.30	56.10	61.50	58.30
1.250	57.30	56.10	61.50	58.30
1.350	57.30	56.10	61.50	58.30
1.500	57.30	56.10	61.50	58.30
1.625	55.00	53.60	.....	56.20
1.750	55.00	53.60	60.30	56.20
1.875	55.00	53.60	.....	56.20
2.000	55.00	53.60	60.30	56.20
2.125	53.50	52.10	.....	.....
2.250	53.50	52.10	.....	56.20
2.375	53.50	52.10	.....	.....
2.500	53.50	52.10	.....	56.20
2.625	.....	50.40	.....	.....
2.750	51.90	50.40	.....	56.20
2.875	.....	50.40	.....	.....
3.000	51.90	50.40	.....	56.20
3.125	.....	50.40	.....	.....
3.250	.....	50.40	.....	.....
3.375	.....	50.40	.....	.....

*Selected sizes.

Forging Stock: Round, Class 1, random lengths, diam., 0.375-8 in., "F" temper; 2014, 42.20-55.00; 6061, 41.60-55.00; 7075, 61.60-75.00; 7070, 66.60-80.00.

Pipe: ASA schedule 40, alloy 6063-T6 standard length, plain ends, 90,000 lb base, dollars per 100 ft. Nominal pipe sizes: ¾ in., 18.85; 1 in., 29.75; 1¼ in., 40.30; 1½ in., 48.15; 2 in., 58.30; 4 in., 160.20; 6 in., 287.55; 8 in., 432.70.

Extruded Solid Shapes:

Factor	Alloy 6063-T5	Alloy 6062-T6
9-11	42.70-44.20	51.30-55.50
12-14	42.70-44.20	52.00-56.50
15-17	42.70-44.20	53.20-58.20
18-20	43.20-44.70	55.20-60.80

MAGNESIUM

Sheet and Plate: AZ31B standard grade, 0.32 in., 103.10; .081 in., 77.90; .125 in., 70.40; .188 in., 69.00; .250-2.0 in., 67.90. AZ31B spec. grades, .032 in., 171.30; .081 in., 108.80; .125 in., 98.10; .188 in., 95.70; .250-2.00 in., 93.30. Tread plate, 60-192 in. lengths, 24-72 in. widths; .125 in., 74.90; .188 in., 71.70-72.10; .25-.75 in., 70.60-71.60. Tooling plate, 0.25-3.0 in., 73.00.

Extruded Solid Shapes:

Factor	Com. Grade (AZ31C)	Spec. Grade (AZ31B)
6-8	65.30-67.60	84.60-87.40
12-14	65.30-67.60	85.70-88.00
24-26	66.10-75.30	90.60-91.30
36-38	66.10-75.30	104.20-105.30

NONFERROUS SCRAP

DEALERS' BUYING PRICES

(Cents per pound, New York in ton lots.)

Copper and Brass: No. 1 heavy copper and wire, 25.00-25.50; No. 2 heavy copper and wire, 23.00-23.50; light copper, 21.00-21.50; No. 1 composition red brass, 19.00-19.50; No. 1 com-

BRASS MILL PRICES

MILL PRODUCTS a

	Sheets, Strip, Plate	Rod	Wire	Seamless Tubes	SCRAP ALLOWANCES e (Based on copper at 31.50c) Clean Heavy	Rod Ends	Clean Turnings
Copper	55.63b	52.86c	.....	55.82	27.500	27.500	26.750
Yellow Brass	48.24	32.73d	48.78	51.65	20.625	19.750	18.750
Low Brass, 80%	51.23	51.17	51.77	54.54	23.250	23.000	22.500
Red Brass, 85%	52.29	52.23	52.83	55.60	24.250	24.000	23.500
Com. Bronze, 90%	53.90	53.84	54.44	56.96	25.125	24.875	24.375
Manganese Bronze	56.54	50.14	60.62	.....	19.125	18.875	18.375
Muntz Metal	50.85	46.16	.....	.....	19.375	19.125	18.625
Naval Brass	52.80	46.61	59.36	56.21	19.125	18.875	18.375
Silicon Bronze	60.67	59.86	60.21	78.35	27.000	26.750	26.000
Nickel Silver, 10%	63.82	66.15	66.15	.....	25.500	25.250	12.625
Phos. Bronze	75.34	75.84	75.84	77.02	28.625	28.375	25.750

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb.

position turnings, 17.25-17.75; new brass clippings, 17.50-18.00; light brass, 12.25-12.75; heavy yellow brass, 13.25-13.75; new brass rod ends, 15.00-15.50; auto radiators, unsweated, 14.50-15.00; cocks and faucets, 15.50-16.00; brass pipe, 15.50-16.00.

Lead: Soft scrap lead, 7.75-8.25; battery plates, 2.25-2.50; linotype and stereotype, 9.25-9.75; electrotype, 7.75-8.25; mixed babbitt, 9.50-10.00.

Monel: Clippings, 30.00-32.00; old sheets, 25.00-27.00; turnings, 20.00-21.00; rods, 30.00-32.00.

Nickel: Sheets and clips, 52.00-54.00; rolled anodes, 52.00-54.00; turnings, 38.00-40.00; rod ends, 52.00-54.00.

Zinc: Old zinc, 3.25-3.50; new diecast scrap, 3.00-3.25; old diecast scrap, 1.75-2.00.

Aluminum: Old castings and sheets, 11.00-11.50; clean borings and turnings, 7.00-7.50; segregated low copper clips, 14.50-15.00; segregated high copper clips, 14.50-15.00; mixed low copper clips, 14.75-15.25; mixed high copper clips, 12.00-12.50.

(Cents per pound, Chicago)

Aluminum: Old castings and sheets, 12.25-12.75; clean borings and turnings, 10.00-10.50; segregated low copper clips, 17.25-17.75; segregated high copper clips, 16.25-16.75; mixed low copper clips, 16.50-17.00; mixed high copper clips, 15.75-16.25.

(Cents per pound, Cleveland)

Aluminum: Old castings and sheets, 11.00-11.50; clean borings and turnings, 10.50-11.00; segregated low copper clips, 15.50-16.00; segregated high copper clips, 14.50-15.00; mixed low copper clips, 15.00-15.50; mixed high copper clips, 14.00-14.50.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 57.50; light scrap, 52.50; turnings and borings, 37.50.

Copper and Brass: No. 1 heavy copper and wire, 28.00; No. 2 heavy copper and wire, 26.75; light copper, 24.50; refinery brass (60% copper) per dry copper content, 26.25.

INGOTMAKERS' BUYING PRICES

Copper and Brass: No. 1 heavy copper and wire, 28.00; No. 2 heavy copper and wire, 26.75; light copper, 24.50; No. 1 composition borings, 21.50; No. 1 composition solids, 22.00; heavy yellow brass solids, 16.00; yellow brass turnings, 15.00; radiators, 17.00.

PLATING MATERIAL

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes, $1.30.

Copper: Flat-rolled, 47.79; oval, 46.00, 5000-10,000 lb; electrodeposited, 40.50, 2000-5000 lb lots; cast, 43.00, 5000-10,000 lb quantities.

Nickel: Depolarized, less than 100 lb, 114.25; wire, 27.00; No. 2 heavy copper and wire, 26.00; light copper, 23.75; refinery brass deduct 3 cents a lb.

Tin: Bar or slab, less than 200 lb, 122.50; 200-499 lb, 121.00; 500-999 lb, 120.50; 1000 lb or more, 120.00.

Zinc: Balls, 18.00; flat tops, 18.00; flats, 20.75; ovals, 20.00, ton lots.

CHEMICALS

Cadmium Oxide: $1.30 per lb in 100-lb drums.
Chromic Acid (flake): 100-2000 lb, 31.00; 2000-10,000 lb, 30.50; 10,000-20,000 lb, 30.00; 20,000 lb or more, 29.50.

Copper Cyanide: 100-200 lb, 65.90; 300-900 lb, 63.00; 1000-19,900 lb, 61.90.

Copper Sulphate: 100-1900 lb, 15.30; 2000-5900 lb, 13.30; 6000-11,900 lb, 13.05; 12,000-22,900 lb, 12.80; 23,000 lb or more, 12.30.

Nickel Chloride: 100 lb, 45.00; 200 lb, 43.00; 300 lb, 42.00; 400-4900 lb, 40.00; 5000-9900 lb, 38.00; 10,000 lb or more, 37.00.

Nickel Sulphate: 5000-22,999 lb, 29.00; 23,000-39,990 lb, 28.50; 40,000 lb or more, 28.00.
Sodium Cyanide (Cyanobrik): 200 lb, 20.80; 400-800 lb, 19.80; 1000-19,800 lb, 18.80; 20,000 lb or more, 17.80.

Sodium Stannate: Less than 100 lb, 80.60; 100-600 lb, 71.20; 700-1900 lb, 68.40; 2000-9900 lb, 66.60; 10,000 lb or more, 65.20.

Stannous Chloride (Anhydrous): 25 lb, 156.20; 100 lb, 151.40; 400 lb, 148.90; 800-19,900 lb, 108.00; 20,000 lb or more, 102.00.

Stannous Sulphate: Less than 50 lb, 141.30; 50 lb, 111.30; 100-1900 lb, 109.30; 2000 lb or more, 107.30.

Zinc Cyanide: 100-200 lb, 59.00; 300-900 lb, 57.00.

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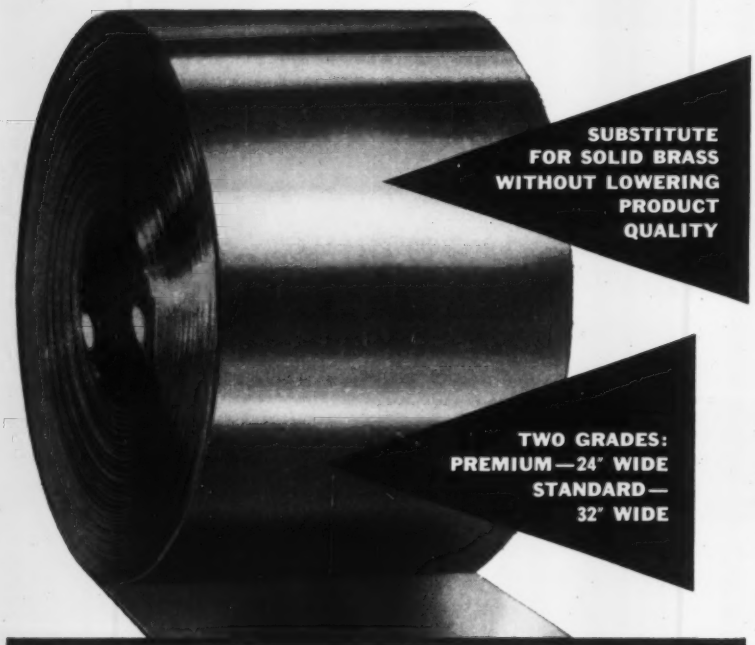

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PERU 1, ILLINOIS

Mills: Peru, Ill. and Walnutport, Pa. — Sales Offices Throughout the U.S.A.

(*Concluded from Page* 139)

Canada, 2281 tons; Netherlands, 538; West Germany, 2468; Australia and Oceania, 227.

Custom Shapes Offered by H. K. Porter Divisions

A full line of custom shapes to meet individual needs and product applications is offered design engineers by three divisions of H. K. Porter Company Inc., Pittsburgh: Connors Steel Div., Huntington, W. Va., hot rolled shapes; Vulcan-Kidd Steel Div., Aliquippa, Pa., cold drawn shapes; Mouldings Div., Detroit, roll formed shapes.

Custom shapes are produced to precise requirements and finished dimensions, allowing greater freedom in design.

Plates . . .

Plate Prices, Page 128

Some plate mills have full order books for July, not taking into account the certain likelihood of a carryover at the end of this month, amounting to at least two weeks' production.

Most producers are running behind on shipment promises, and conditions will worsen as the month advances. One eastern maker of sheared plates estimates June shipments will run about 85 per cent of orders for that month. The position of universal plate sellers is almost as tight.

Rails, Cars . . .

Track Material Prices, Page 131

Freight car awards declined sharply in April, totaling 3736 units vs. 10,795 in March, says a joint report of the American Railway Car Institute and the Association of American Railroads. In April last year, only 278 cars were ordered.

Deliveries are tending upward, the April total of 3741 comparing with 2797 in March. In April, 1958, the total was 5163 units.

Order backlogs as of May 1 showed 20,928 cars on order in railroad shops, and 14,551 in the shops of contract carbuilders for a total of 35,479. That figure compares with 35,487 on order and undelivered on Apr. 1, and with 32,908 on May 1, 1958.

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R. P. Adams Co., Inc., 222 East Park Drive, Buffalo 17, New York.

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But in the routine of making a home and earning a living, there's one essential that it's too easy to overlook: your health...the health of your family.

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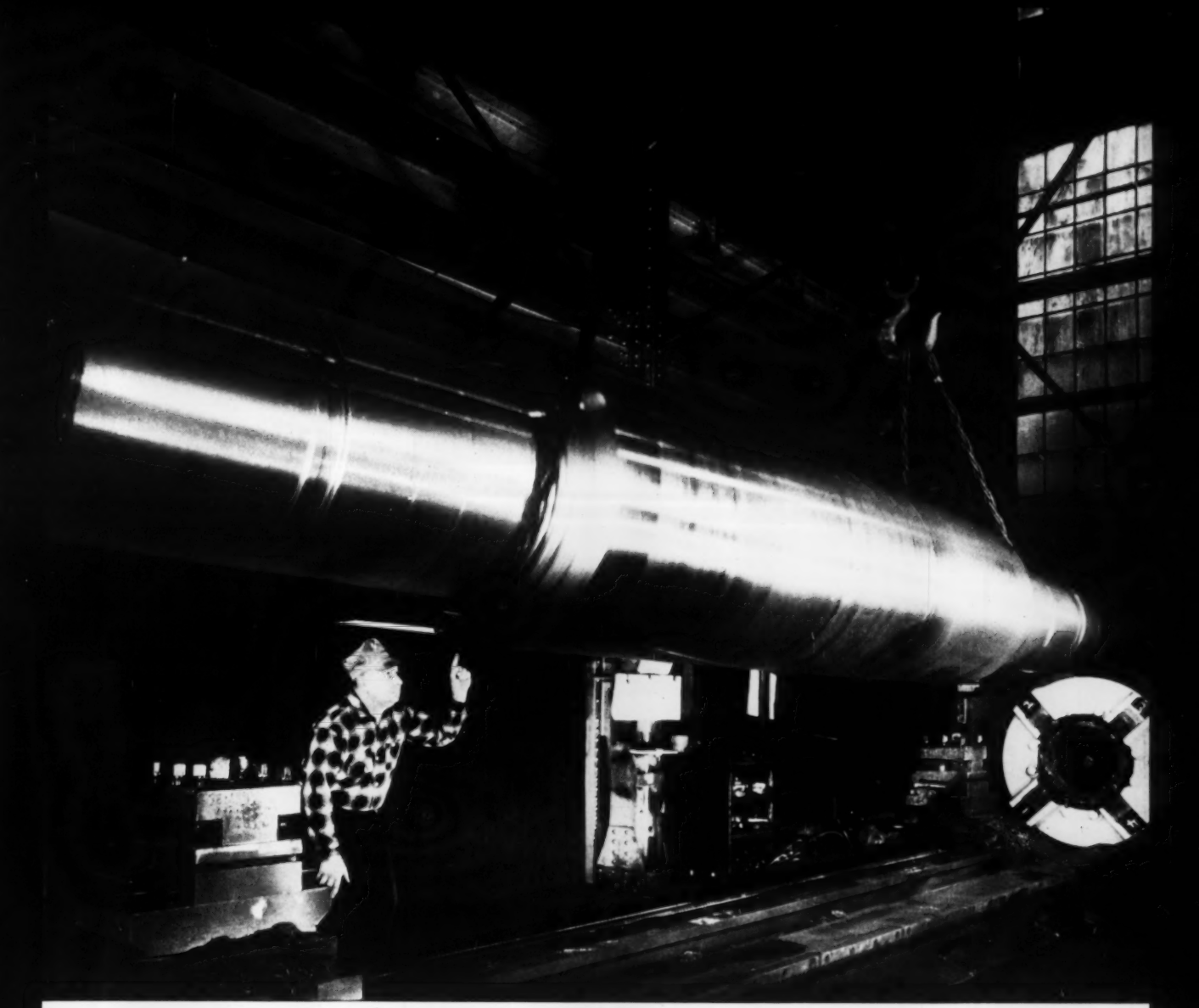
American Cancer Society



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. . . About three tons of it just came off in that lathe. For this "big boy" is a forty-ton plate mill roll—one of the largest made.

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